

Packaged Electromagnetic Clutches/Brakes



An Altra Industrial Motion Company

A Broad Range of Clutches, Brakes and Clutch/Brake Combinations

Warner Electric packaged performance products are electric clutches and brakes, assembled and aligned at the factory, to offer maximum start-stop performance combined with quick and easy installation. They are offered as clutches, brakes, and clutch/brake combinations in a wide range of sizes and torque ratings.

All packaged performance products have been designed to mate easily with industry standard motors, reducers, and other power transmission components. They can be foot mounted, shaft mounted, or installed on C-face motors and reducers.

Bolt-it-down, wire-it-up . . . they're ready to go. Most packaged performance products are recognized and/or listed by Underwriters Laboratories.

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Packaged Performance Products

Electromagnetic Clutches and Brakes

Packaged Products Benefits

Warner Electric Packaged Products come pre-assembled, ready to install right out of the box.

Warner Electric Packaged Products consist of a single part number in most cases. One part number to inventory, one part number to track in your engineering system.

All Warner Electric packaged products incorporate our Autogap™ mechanism that automatically adjusts for wear. This eliminates the need for maintenance, but more importantly, it ensures the same engagement time cycle after cycle after cycle through the whole life of the unit ensuring consistent product manufacturing processes.

Warner Electric Packaged designs are available for:

- C-face mount applications
- Parallel shaft applications
- Base mount applications

The Basics

The electric clutch and brake has been called the best thing that ever happened to the electric motor. It's simple, electric clutches and brakes do all the work, while permitting motors to run smoothly and continuously at their most efficient speed by connecting/disconnecting the motor and the load. Fast starts and stops, easy control interface, remote pushbutton operation and smooth acceleration and deceleration are outstanding user benefits.

Reliable Performance

- High cycle rates
- Smooth soft starts
- Cushioned stops
- Accurate positioning
- Indexing
- Jogging
- Reversing
- Speed changing

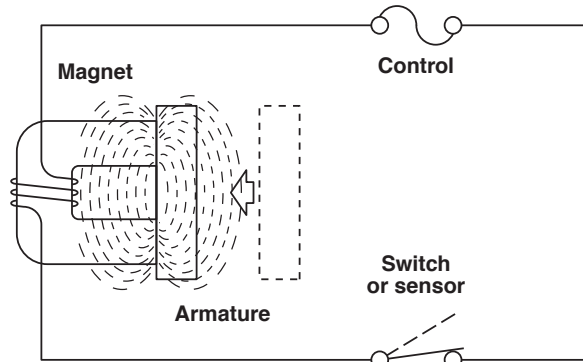


Packaged Performance Products

Electromagnetic Clutches and Brakes

Principle of Operation

A key feature of Warner Electric brakes and clutches is the method of actuation. Like an electromagnet, they have two basic parts. A magnetic field is generated as soon as the current flows through the magnet coil. This draws the armature into direct contact with the magnet. The strength of the magnetic field is directly proportional to the amount of current applied. Full range torque control from 0 to 100% is as simple as turning the knob on a light dimmer.



Fast and Accurate

The benefits of electric actuation combined with the use of small, low inertia components is fast response, high cycle rates, and increased accuracy. While other devices are often sluggish and slow to respond, electric brakes and clutches respond instantly, resulting in higher productivity and better consistency.

Controllable

Electric brakes and clutches are incredibly easy to control. The shift from positive, instantaneous engagement to soft, cushioned starts and stops is as simple as turning a knob.

Easy to Select

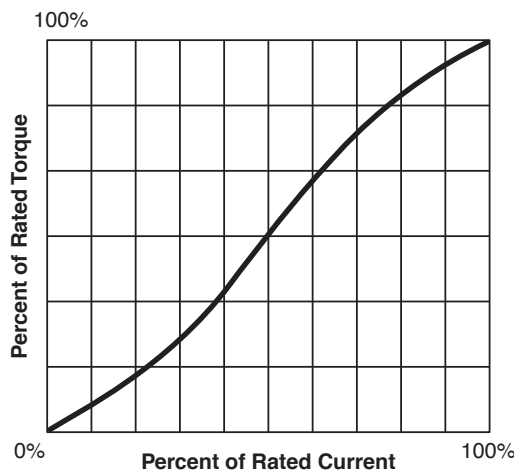
Most of the time, all you need to know is motor horsepower and the speed at the brake or clutch location. Warner Electric takes care of the rest. The performance you require is built in, and with the broad range of products to choose from, you won't have to compromise with a clutch or brake that's a little too big or a little too small.

Maintenance Free

Warner Electric brakes and clutches are clean and quiet. They require no maintenance. They never need lubrication, and they're completely self adjusting for wear. No complicated air system or messy hydraulics. Warner Electric brakes and clutches are outstandingly trouble free.



Torque/Current Curve



C-face Clutches and Clutch/Brake Assemblies

Electro Module

Individual Clutch and Brake Modules



EM Series

Page 24

Modular Components that are Easily Combined

- ❑ 5 sizes
- ❑ 16 clutch and brake modules
- ❑ 16 to 95 lb. ft. torque range

Individual modules may be used in combination to form clutches, brakes or clutch/brake packages.

Electro Modules can be bolted directly to NEMA C-face motors or reducers, or base mounted for stand alone operation.

Service Parts, see page 248.

UM Smooth-Start

Page 40

Soft Engage Designs

- ❑ 5 sizes
- ❑ 10-57 lb.ft. torque range

Smooth-Start designs allow for a soft engage clutch and brake without sacrificing unit life.

UniModule®

One Piece Preassembled Clutches and Clutch/Brakes



UM Series

Page 14

C-face or Base Mounted Units

- ❑ 5 sizes
- ❑ 20 combinations
- ❑ 16 to 95 lb. ft. torque range

UniModule clutches and clutch/brake packages offer the ultimate in installation convenience.

Can be motor or reducer mounted, or used as a separate drive unit powered from a prime mover.

Service Parts, see page 232.

UM-C Series

Page 42

High Performance Version for High Cycle Rate Applications

- ❑ 3 sizes
- ❑ 6 combinations
- ❑ 16 to 95 lb. ft torque range

The UM-C units are UniModules with ceramic faced components, specifically designed for long life, high energy, and high cycle rate applications.

Enclosed UniModule®

Preassembled Units Offer Clean, Quiet Operation



EUM Series

Page 49

Totally Enclosed Clutch and Brake Packages

- ❑ 5 sizes
- ❑ 3 combinations
- ❑ 16 to 95 lb. ft. torque range

Totally enclosed, rugged enclosure keeps wear particles in and contaminants out. Finned for rapid heat dissipation and long life.

Service Parts, see page 262.

EUM-W Series

Page 59

Washdown Version

- ❑ 5 sizes
- ❑ 8 combinations
- ❑ 16 to 95 lb. ft. torque range

The washdown version of the EUM uses stainless steel shafting, USDA approved coating, corrosion resistant fasteners and special seals.

Service Parts, see page 262.

See Page 7 for GEN 2 Information

Packaged Performance Products

Shaft and Foot Mounted Units

Electro Clutches Electro Brakes

Shaft Mounted Units



EC Series Clutches **Page 68**

Pre-Packaged Convenience

- ❑ 6 sizes
- ❑ 16 to 465 lb. ft. torque range

All the features of an electric clutch in a convenient, pre-packaged assembly. Mounts on any through shaft or extended motor shaft. Easy-to-assemble with standard sheaves, pulleys, gears and sprockets. Packaged design. No assembly required. Long life. No maintenance.

Service Parts, see page 270.

EB Series Brakes **Page 74**

Torque Arm Mounting

- ❑ 6 sizes
- ❑ 16 to 465 lb. ft. torque range

Torque arm feature makes Electro Brakes easy to mount on any motor or through shaft. Packaged design. No assembly required. Long life. No maintenance.

Service Parts, see page 276.

Advanced Technology Clutches and Brakes

Extra Rugged Design



ATC Series Clutches **Page 84** ATB Series Brakes **Page 88** Replaceable Friction Faces

- ❑ 3 sizes
- ❑ 25 to 115 lb. ft. torque range

Rugged, heavy duty units designed for extra long life and efficient operation. Cast components for durability. Finned armatures for high heat dissipation.

Friction faces are designed to allow for replacement without replacing valuable, non-wear components. Provides superior wear life with reduced engagement noise.

Service Parts, see page 282.

SFP Series Clutches **Page 90**

- ❑ Pre-assembled SF – No assembly required
- ❑ Ball bearing mounted field and armature
- ❑ 70 inch pound and 270 inch pound sizes
- ❑ Bore sizes from 3/8" to 1/2" and 1/2" to 1"

SFP clutches provide the simplicity and cost efficiency of the Basic SF design, but with a ball bearing mounted armature hub.

Electro Pack Clutch/Brakes

Foot Mounted Units



EP Series **Page 94**

Totally Enclosed Units

- ❑ 8 sizes
- ❑ 15 lb. to 1350 lb. ft. torque range

Electro Packs are rugged, pre-assembled clutch and brake combinations in enclosed, foot mounted housings.

Service Parts, see page 286.

EP-C Series **Page 100**

High Performance Version

- ❑ 2 sizes
- ❑ 15 and 70 lb. in. torque

Ceramic faced wear components provide long life for high cycle rate use. Consistent torque and cycle repeatability with Smooth-Start/stop control.

EP-W Series **Page 104**

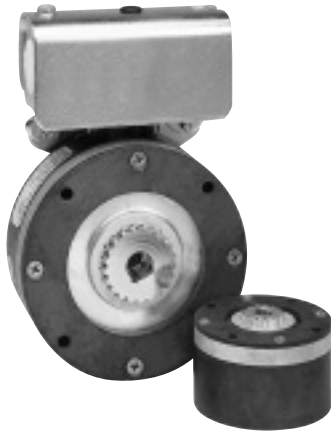
Washdown Design

- ❑ 2 sizes
- ❑ 70 and 270 lb. in. static torque ranges
- ❑ USDA approved coating
- ❑ Stainless steel shaft and hardware
- ❑ Available in 24 or 90 volt DC

Electrically Released Brakes

Spring-Set Brakes

For Power-Off Static Holding and Emergency Stopping Applications



ERS Series Page 109

Static Engaged

- ❑ 5 sizes
- ❑ 1.5 to 100 lb. ft. holding torque

Designed for static holding, ERS models feature multiple coil springs that force armature and friction faces together to generate braking torque when power is off. The Electromagnet counters the spring force to disengage the brake when power is applied.

Although this brake should be engaged only when the shaft is at rest, it can occasionally act as a dynamic braking device to stop a rotating load in an emergency situation.

Spring Set Brake Module Page 117

- ❑ 7 to 100 lb. ft. holding torque
- NEMA C-face version of the ERS Series



ERD Series Page 121

Dynamic Braking

- ❑ 8 sizes
- ❑ 4 to 221 lb. ft. holding torque

ERD units are electrically released, static and dynamic engaged, spring-set brakes for power-off load holding applications. These spring-set brakes automatically stop and hold a load in the event of a power failure or other emergency stop situations. Fully dynamic friction material allows for repeated braking cycles from full motor speed with no torque fade. An optional manual release allows the brake to be released by hand.

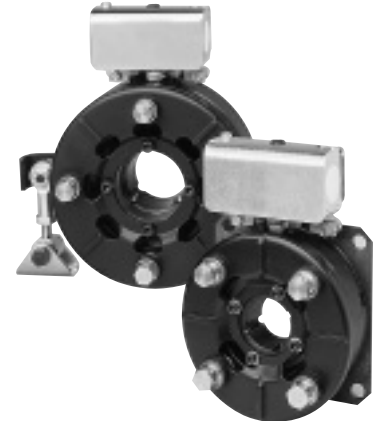
Unibrake Series Page 170

AC Motor Brakes

- ❑ Spring Set/Solenoid Released
- ❑ Direct acting/manual release standard 3 families
- ❑ 3, 6, 10 and 15 lb. ft. capacity
- ❑ Steel or cast iron covers
- ❑ Rear mount or double C-face designs

Permanent Magnet Brakes

For Power-Off Dynamic Stopping and Cycling Applications



FB Series Page 135

Shaft Mounted, Dynamic Braking

- ❑ 3 models
- ❑ 10.5 to 56 lb. ft. static torque

Permanent magnet brakes are designed to dynamically stop and hold a moving load and also for high cycle rate stopping. Electric power to the coil nullifies the attraction of the permanent magnet, releasing the brake.

FB models are pre-assembled and feature a torque arm for convenient shaft mounting.

Service Parts, see page 294.

ER Series Page 138

Flange Mounted, Dynamic Braking

- ❑ 5 models
- ❑ 10.5 to 400 lb. ft. static torque

The ER style brake offers a bulk head flange mounting system, the highest torque rating offered by Warner Electric in the power released series, high cycle rate capability, and excellent life. They require some assembly.

Service Parts, see page 296.

Packaged Performance Products

Electrically Released Module Brakes

Permanent Magnet, Power-Off Brakes

C-face Brake Modules



Electro Module **Page 159**

Individual Module Components EM-FBC (Clutch/Brakes)

- ❑ 3 sizes
- ❑ 10.5 to 56 lb. ft. torque range

Used in combination with an Electro Module motor or input clutch module for clutch/brake applications. Electrical power applied to the brake coil nullifies the permanent magnets' force and the brake releases. No springs to limit cycle rates.

EM-FBB (Brake Modules)

- ❑ 5 sizes
- ❑ 10.5 to 56 lb. ft. torque range

Use for brake alone applications. Mounts between a C-face motor and reducer. Recommended for dynamic cycling operations only.

EM-MBFB (Motor Brakes)

- ❑ 4 sizes
- ❑ 56C to 215C frame motors

Mounts to the back of a double shafted C-face motor. Never needs adjustment or lubrication.

UniModule **Page 144**

One Piece Packages UM-FBC (Clutch/Brakes)

- ❑ 4 sizes
- ❑ 7 combinations
- ❑ 10.5 to 56 lb. ft. static brake torque

UniModule pre-assembled clutch and electrically released brake packages are available in both C-face and base mounted versions.

Unique design employs powerful permanent magnets for maximum torque when power is removed from the brake coil. A small amount of electrical power applied to the brake coil nullifies the permanent magnets and the brake releases. No springs to limit cycle rates. Never any adjustment. No lubrication. These brakes are recommended for dynamic cycling operations only.

Enclosed UniModule **Page 151**

Totally Enclosed EUM-FBB (Brake Modules)

- ❑ 4 sizes
- ❑ 6 to 32 lb. ft. static torque

Totally enclosed UniModule electrically released brake packages keep contaminants out and wear particles in for clean, quiet operation. Assembly, alignment, and preburnishing have been done at the factory. Use for brake alone applications, mountings between a motor and a gear reducer. Select the torque required for the application. Higher torque brakes stop loads faster. Lower torque models provide softer stopping to prevent boxes on conveyors from tipping or skidding.

EUM-MBFB (Motor Brakes)

- ❑ 4 sizes
- ❑ 56C to 215C frame motors

UniModule motor brakes are used for dynamic stopping and holding of loads when power is removed from the motor. Typical applications include conveyors, process equipment, and lifting devices. Mounts to a double shafted C-face motor.

See Page 7 for GEN 2 Information

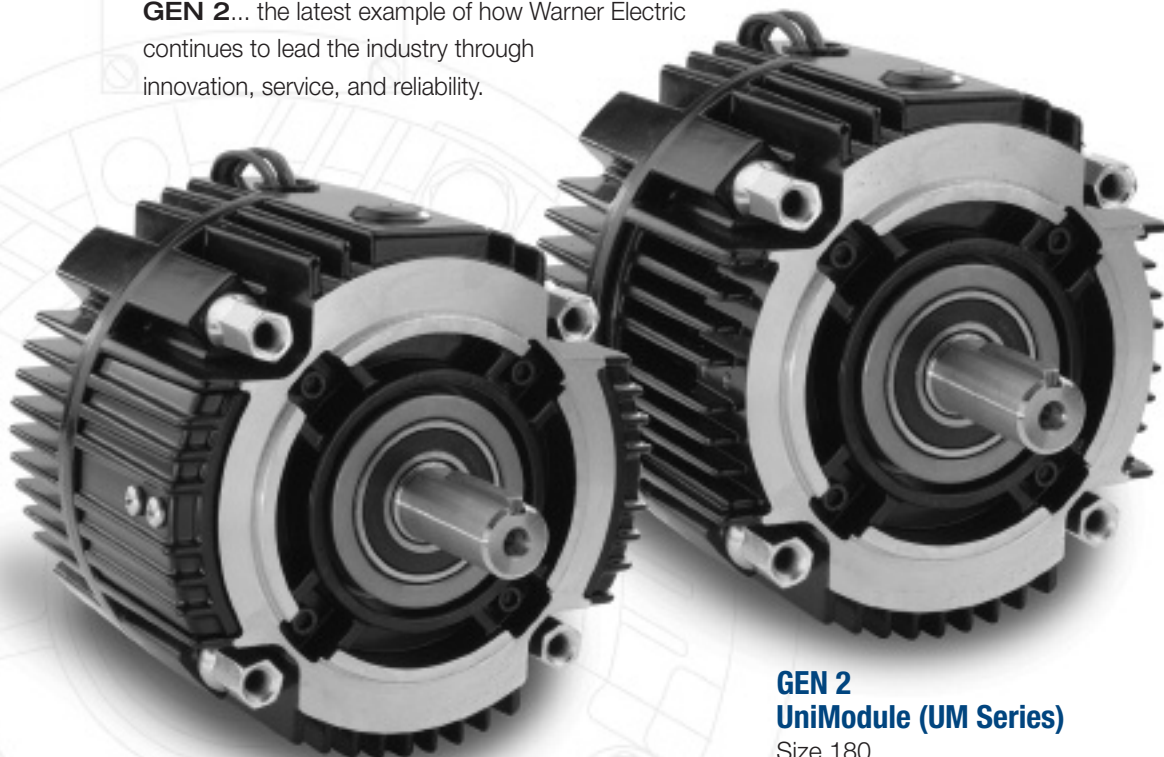
The next evolution in Module Brake Technology is available today from Warner Electric

Warner Electric designed and patented the first electromagnetic clutch/brake more than 70 years ago and has pioneered most significant advances in the field since then including the introduction of the single piece UniModule in 1989.

Today, new technologies in the areas of design, materials and manufacturing have helped us develop our new **GEN 2** clutches and brakes which incorporate several changes that affect unit appearance and performance without affecting unit fit or wiring requirements.

Many models within our Packaged Clutch and Brake product offering are now available in the new **GEN 2** design. These units contain many shared parts while still meeting our high manufacturing standards and performance characteristics.

GEN 2... the latest example of how Warner Electric continues to lead the industry through innovation, service, and reliability.



GEN 2
Enclosed UniModule (EUM Series)
Size 180

With optional Cover Kit
(containing 2 covers and 4 screws) which converts a
UniModule to an enclosed (non-washdown) design

GEN 2
UniModule (UM Series)
Size 180

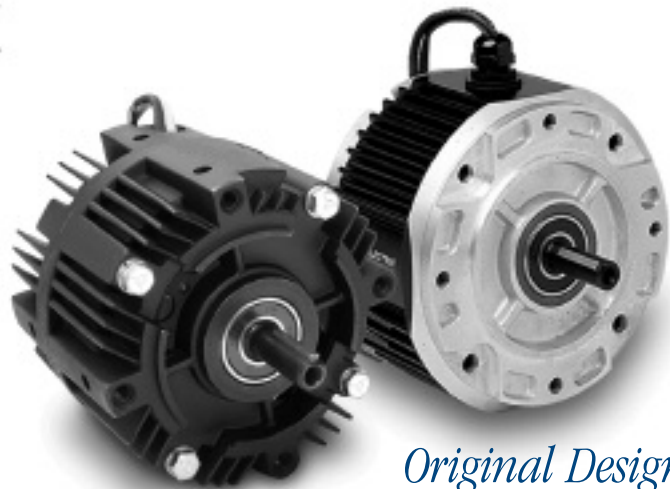
With open housing vents
(standard)

GEN 2 Clutches and Brakes

GEN 2 units are direct replacements for original models

- Wiring and cycling are not affected by the new design
- Conduit box positions directly vertical on the top of the unit instead of 15° or 60° off of vertical
- Rotor set screw access is improved for easier installation
- Use of integrated mounting bolts make installation easier and faster
















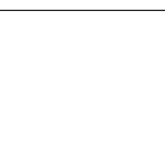
GEN 2 Design



Original Design

GEN 2 Clutches and Brakes

Only 50, 100, and 180 sizes of the models listed below will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered only in the original design and will not be converted.

| Pages | C-face Compatible Units | GEN 2 Models | | Original Design Models | |
|---|--|---|------------------|---|------------|
| | | | Sizes | | Sizes |
| 12–23 | UniModules (UM Series) Enclosed UniModules (EUM Series) |  | 50 100 180 |  | 210 215 |
| 24–39 | Electro Modules (EM Series) Enclosed Option |  | 50 100 180 |  | 210 |
| 40–41 | Smooth-Start Modules |  | 50 100 180 |  | 210 215 |
| 42–48 | UniModules – Ceramic Faced (UM-C Series) |  | 50 100 180 |  | 210 |
| Electrically Released Units | | | | | |
| 117–120 | Spring Set Brake Modules (EM/ERS Series) |  | 50 180 |  | 210 |
| 144–150 | UniModules (UM-FBC Series) |  | 50 100 180 |  | 210 215 |
| 151–158 | Enclosed UniModules (EUM-FBB, MBFB Series) |  | |  | |
| 159–169 | Electro Modules (EM-FBB, FBC, MBFB Series) Enclosed Option |  | 50 100 180 |  | 210 215 |
| Enclosed UniModules - Washdown (EUM-W Series) | | | | | |

GEN 2 Clutches and Brakes

Ordering
GEN 2 models is easy...

Selected models (50,100, and 180 sizes)
highlighted in blue tint throughout this catalog
have been converted to the new GEN 2 design

Part Numbers

(Blue shaded areas indicate GEN 2 design)

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part |
|--------------------------------|--------------|----------------|---------------|
| 1020 Motor Clutch Brake | | | |
| UM-50-1020 | 6 | 5370-273-201 | 5370-273-016 |
| UM-50-1020 | 24 | 5370-273-203 | 5370-273-018 |
| UM-50-1020 | 90 | 5370-273-204 | 5370-273-017 |
| UM-100-1020 | 6 | 5370-273-206 | 5370-273-026 |
| UM-100-1020 | 24 | 5370-273-208 | 5370-273-028 |
| UM-100-1020 | 90 | 5370-273-209 | 5370-273-027 |
| UM-180-1020 | 6 | 5370-273-211 | 5370-273-006 |
| UM-180-1020 | 24 | 5370-273-213 | 5370-273-008 |
| UM-180-1020 | 90 | 5370-273-214 | 5370-273-007 |
| UM-210-1020 | 6 | | 5371-273-002 |
| UM-210-1020 | 24 | | 5371-273-004 |
| UM-210-1020 | 90 | | 5371-273-003 |
| UM-15-1020 | 6 | | 5371-273-076 |
| UM-15-1020 | 24 | | 5371-273-077 |
| UM-15-1020 | 90 | | 5371-273-078 |

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part |
|-----------------------------------|--------------|----------------|---------------|
| Motor Clutch Output Clutch | | | |
| UM-1040 | 6 | 5370-271-201 | 5370-271-004 |
| UM-1040 | 24 | 5370-271-203 | 5370-271-006 |
| UM-1040 | 90 | 5370-271-204 | 5370-271-005 |
| UM-1040 | 6 | 5370-271-206 | 5370-271-024 |
| UM-1040 | 24 | 5370-271-208 | 5370-271-026 |
| UM-1040 | 90 | 5370-271-209 | 5370-271-025 |
| UM-1040 | 6 | 5370-271-211 | 5370-271-014 |
| UM-1040 | 24 | 5370-271-213 | 5370-271-016 |
| UM-1040 | 90 | 5370-271-214 | 5370-271-015 |
| UM-1040 | 6 | | 5371-271-002 |
| UM-1040 | 24 | | 5371-271-004 |
| UM-1040 | 90 | | 5371-271-003 |
| UM-1040 | 6 | | 5371-271-026 |
| UM-1040 | 24 | | 5371-271-027 |
| UM-1040 | 90 | | 5371-271-028 |

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part |
|---------------------|--------------|----------------|---------------|
| Clutch/Brake | | | |
| UM-5370-273-216 | 6 | 5370-273-216 | 5370-273-021 |
| UM-5370-273-218 | 24 | 5370-273-218 | 5370-273-023 |
| UM-5370-273-219 | 90 | 5370-273-219 | 5370-273-022 |
| UM-5370-273-221 | 6 | 5370-273-221 | 5370-273-031 |
| UM-5370-273-223 | 24 | 5370-273-223 | 5370-273-033 |
| UM-5370-273-224 | 90 | 5370-273-224 | 5370-273-032 |
| UM-5370-273-226 | 6 | 5370-273-226 | 5370-273-011 |
| UM-5370-273-228 | 24 | 5370-273-228 | 5370-273-013 |
| UM-5370-273-229 | 90 | 5370-273-229 | 5370-273-012 |
| UM-5371-273-007 | 6 | | 5371-273-007 |
| UM-5371-273-009 | 24 | | 5371-273-009 |
| UM-5371-273-008 | 90 | | 5371-273-008 |
| UM-5371-273-043 | 6 | | 5371-273-043 |
| UM-5371-273-044 | 24 | | 5371-273-044 |
| UM-5371-273-045 | 90 | | 5371-273-045 |

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part |
|--|--------------|----------------|---------------|
| 3040 Input Clutch Output Clutch | | | |
| UM-50-3040 | 6 | 5370-271-216 | 5370-271-009 |
| UM-50-3040 | 24 | 5370-271-218 | 5370-271-011 |
| UM-50-3040 | 90 | 5370-271-219 | 5370-271-010 |
| UM-100-3040 | 6 | 5370-271-221 | 5370-271-029 |
| UM-100-3040 | 24 | 5370-271-223 | 5370-271-031 |
| UM-100-3040 | 90 | 5370-271-224 | 5370-271-030 |
| UM-180-3040 | 6 | 5370-271-226 | 5370-271-019 |
| UM-180-3040 | 24 | 5370-271-228 | 5370-271-021 |
| UM-180-3040 | 90 | 5370-271-229 | 5370-271-020 |
| UM-210-3040 | 6 | | 5371-271-007 |
| UM-210-3040 | 24 | | 5371-271-009 |
| UM-210-3040 | 90 | | 5371-271-008 |
| UM-215-3040 | 6 | | 5371-271-021 |
| UM-215-3040 | 24 | | 5371-271-022 |
| UM-215-3040 | 90 | | 5371-271-023 |

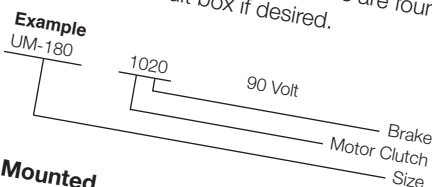
Accessories

| Description | UM Size | Part No. |
|--------------------------------|------------|--------------|
| Conduit Box | All sizes | 5370-101-042 |
| Base Mount Kit for 2030, 3040 | 50/100 | 5370-101-004 |
| | 180 | 5370-101-002 |
| Motor Mount Kit for 1020, 1040 | 210/215 | 5371-101-001 |
| | 50/100 | 5370-101-078 |
| Cover Kit | 180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| | 50/100/180 | 5370-101-076 |

How to Order

Motor or Reducer Mounted

Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Power-off brake UniModules are found on page 106. Order optional conduit box if desired.



Base Mounted

Simply combine the size number with the configuration of the required UniModule. Specify...

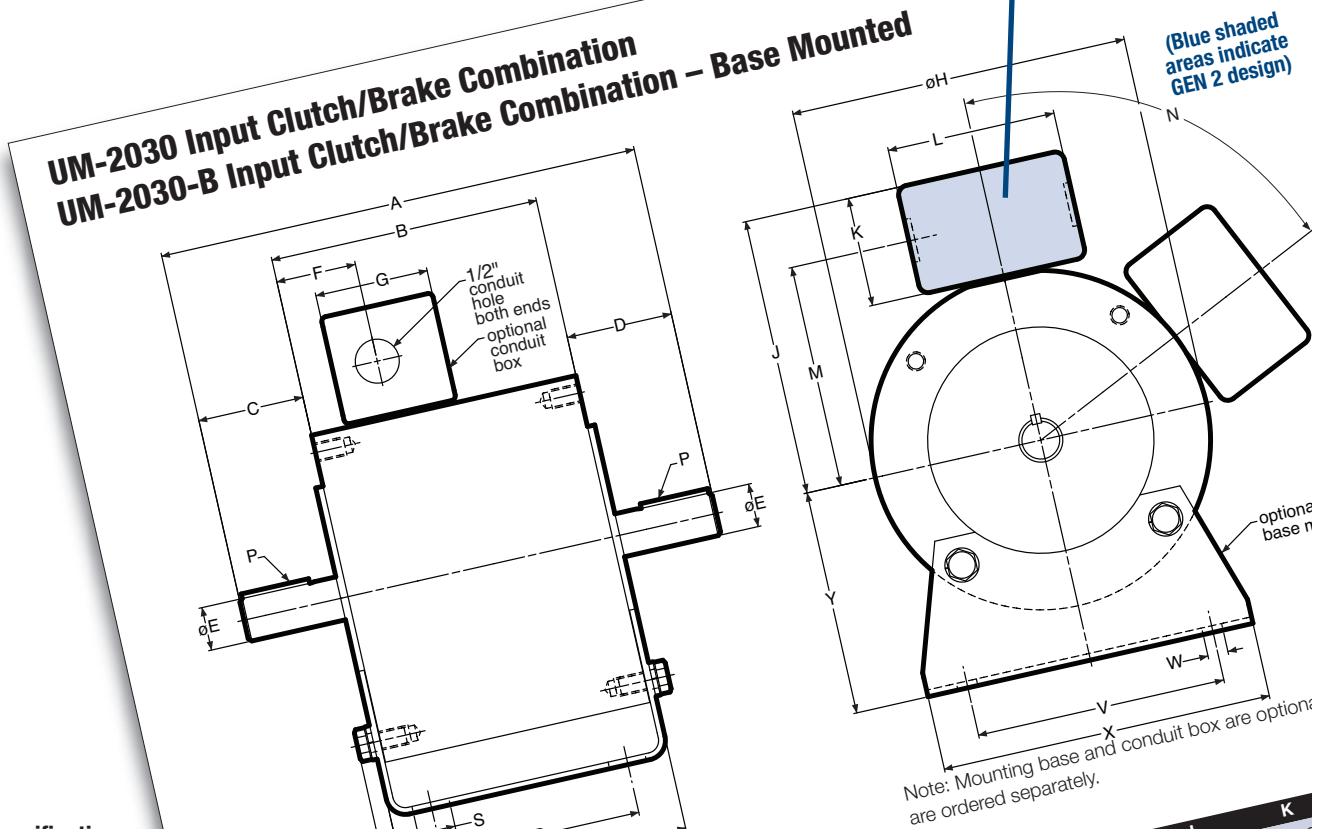
Non tinted, original design models

210 and 215 sizes will continue to be offered only in the original design and will not be converted.

GEN 2 models share the same specifications with original design models but have different dimensions and a modified conduit box location.

New Conduit Box Location

The difference is shown on dimension drawings throughout this catalog. Conduit box positions directly vertical on the top of the unit instead of 15° or 60° off of vertical.



Same Specifications

All original design unit specifications are the same for the new GEN 2 models.

Note that new GEN 2 simplified dimension drawings on the right show only outline footprints of models with no internal details.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 |
| 215 | 12.969 | 7.719 | 2.500 | 2.500 | 1.375 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 |

| Size | N | P | R | S | T | U | V | W | X |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 |
| 100 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 |
| 210 | 65° | 1/4 x 1/4 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 |
| 215 | 65° | 5/16 x 5/16 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 |

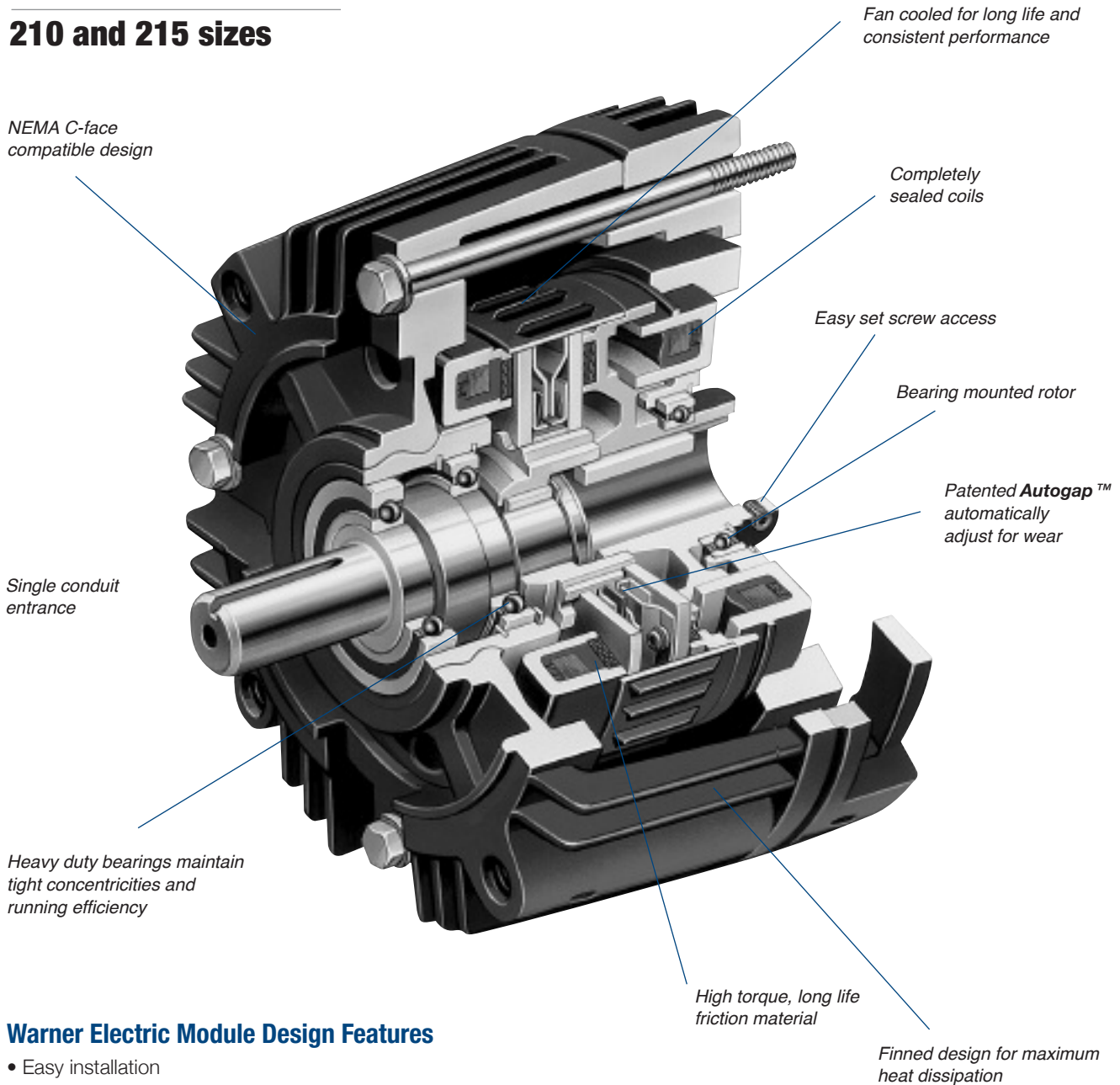
Specifications (Blue shaded areas indicate GEN 2 design)

| Voltage DC | Static Torque lb. ft. | Max. RPM |
|------------|-----------------------|----------|
| 16 | 16 | 3600 |
| 30 | 30 | 3600 |
| 60 | 60 | 3600 |
| 120 | 120 | 3600 |

Packaged Performance Products

Original Design

210 and 215 sizes

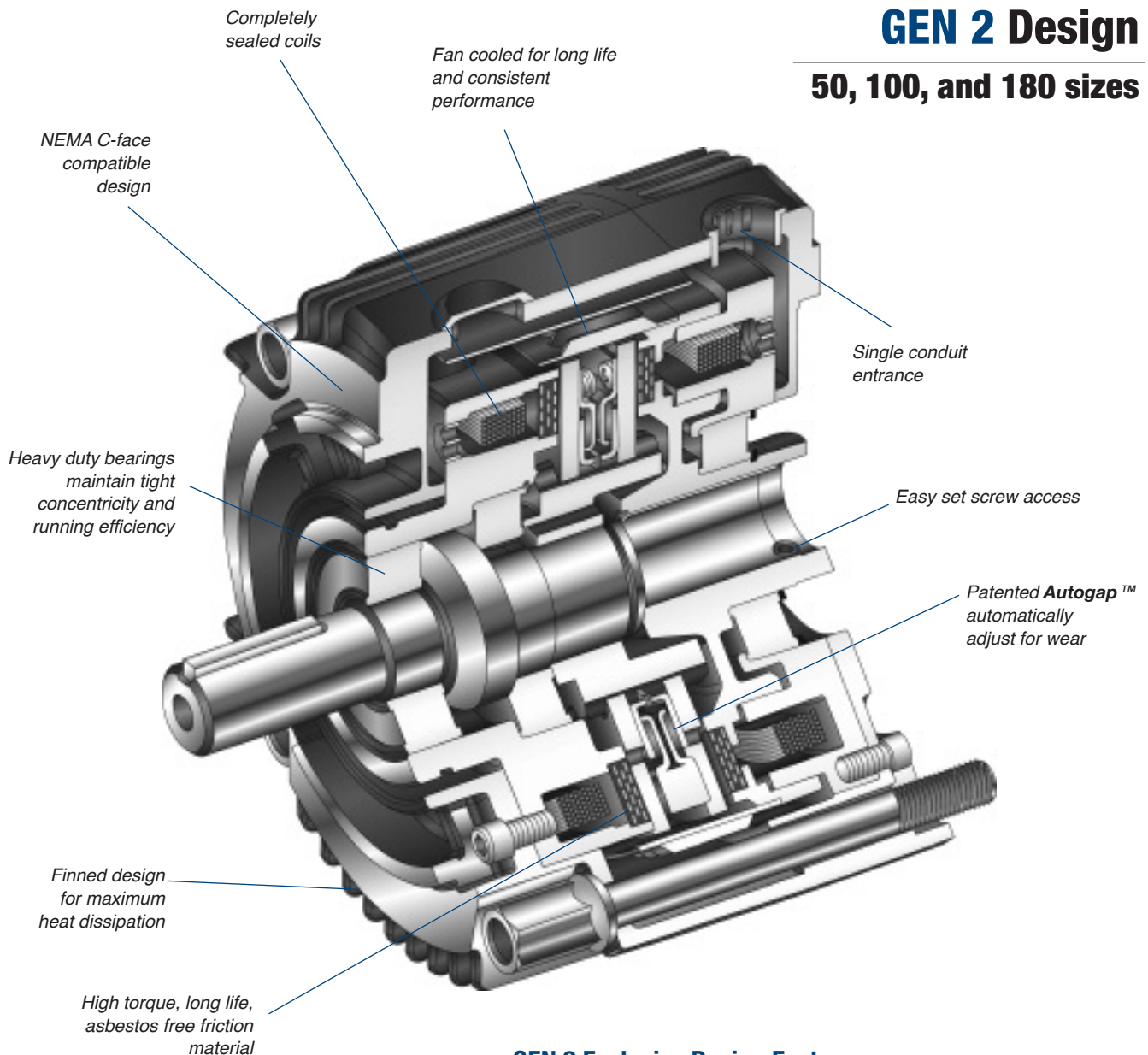


Warner Electric Module Design Features

- Easy installation
- Available with standard power-on and electrically released power-off brake units
- Fan cooled for high cycle rate operation
- Maintenance Free
- UL listed
- Can be applied with control fitted as standard
- Bearing mounted clutch rotor eases assembly alignment
- Single access hole for all wires

GEN 2 Design

50, 100, and 180 sizes



GEN 2 Exclusive Design Features

- Internal component changes make installation easier and faster
- Symmetric housing fin design increases heat dissipation capacity
- Available only in 50, 100, and 180 sizes, NEMA C-face design
- Conduit box relocation simplifies installation. Use of integrated mounting bolts allows for conduit box location directly on the top of the unit
- Available field installed conversion kit creates a totally enclosed clutch/brake package without the need to replace entire unit
- New design allows for more efficient assembly which yields greater availability and shorter lead times
- Improved input to output axis design reduces vibration and improves noise and wear factors
- Heavy-duty models available with increased spline length and higher load capacity bearings.



UM Series UniModule

Pre-assembled, C-face Clutches and Brakes

UniModules offer the ultimate in Clutch/ Brake performance and convenience. UniModules offer the same performance as EM's without the assembly required.

Completely pre-assembled one-piece clutch and clutch/brake packages in five sizes. Can be motor or reducer mounted or used as a separate drive unit powered by a prime mover.

Pre-assembled, pre-aligned, and pre-burnished at the factory for rated torque directly out-of-the-box.

- Easy installation
- Available with standard power-on and electrically released power-off brake units
- Fan cooled for high cycle rate operation
- Maintenance Free
- Available in 50, 100, 180, 210, and 215 sizes. NEMA C-face design
- UL listed
- Can be applied with control fitted as standard
- Bearing mounted clutch rotor eases assembly alignment
- Single access hole for all wires



GEN 2 Design
Sizes 50, 100 & 180

Original Design
Sizes 210 & 215

UniModule Combinations

Clutch Combinations



1040

Motor Clutch/Output Clutch

Use for clutch only applications. Has hollow bore input for mounting directly to C-face motors. Shaft and C-face on output side of unit accommodates reducer, parallel drive or coupling. Motor Clutch is fan cooled for long life and consistent performance. Basic components are field, rotor and armature. See page 21 in this catalog.



3040

Input Clutch/Output Clutch

Use for clutch only applications. Features dual C-faces and shafts. Unit input from parallel drive or coupling. Output to reducer. Input Clutch is fan cooled and has sealed coil. Twin bearing mounted shafts maintain tight concentricities. The Output Clutch utilizes Autogap™ which automatically adjusts armature for wear. Basic components are field, rotor and armature. See page 23 in this catalog.



3040-B

Input Clutch/Output Clutch – with Accessory Base Mounting

Base mounting allows the clutch unit to be utilized as a separate drive unit. Attach with pulleys, sprockets, etc. See page 23 in this catalog.

Clutch/Brake Combinations



1020

Motor Clutch/Brake

Use for clutch/brake applications. Has hollow bore input for mounting directly to C-face motors. Brake shaft and C-face on output side accommodate a reducer, parallel drive or coupling. Basic components: field, rotor, 2 armatures and power-on magnet. See page 20 in this catalog.

Heavy-duty models available with increased spline length and higher load capacity bearings.



2030

Input Clutch/Brake

Use for clutch/brake applications. Features dual C-faces and shafts. Input from parallel drive or coupling. Output to reducer. Basic components are field, rotor, 2 armatures and power-on magnet. See page 22 in this catalog.



2030-B

Input Clutch/Brake – with Accessory Base Mounting

Base mounting allows the clutch/brake units to be utilized as a separate drive unit. Attach with pulleys, sprockets, etc. See page 22 in this catalog.

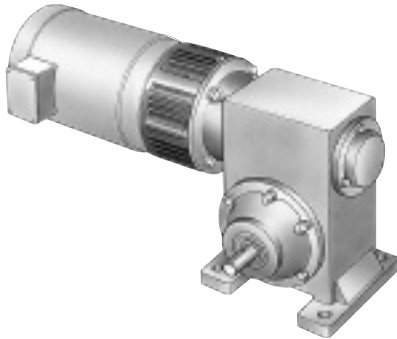
UM Series UniModule

Selection

UniModule clutch, brake and clutch/brake units may be mounted directly to NEMA C-face motors and reducers, or can be base mounted.

1. Select Configuration

a. NEMA C-face Mounting



To select the correct UniModule package, determine the NEMA frame size of your motor and/or reducer, and choose the corresponding size UniModule from the Frame Size Selection chart.

Size UM-100 modules utilize a 5/8" diameter shaft to fit 56C/48Y motor frames with components of UM-180 units for higher torque and heat dissipation capacity than the UM-50.

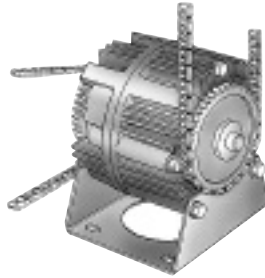
UM-100 modules are available in 1020 and 2030 clutch/brake and 1040 and 3040 clutch configurations. For C-face mounting, select either a 1020 clutch/brake or a 1040 clutch configuration. The 2030 and 3040 configurations are for base mounting.

Frame Size Selection

| NEMA Frame Size | UniModule Size |
|-----------------|----------------|
| 56C/48Y | UM-50* |
| | UM-100** |
| 182C/143TC | UM-180 |
| 184C/145TC | |
| 213C/182TC | UM-210 |
| 215C/184TC | |
| 213TC/215TC | UM-215 |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.
 ** UM-100 size is recommended for motors 1 HP and larger.

b. Base Mounting



UniModule assemblies may be mounted as separate drive units driven from the prime mover by V-belts, chain and sprockets, couplings, timing belts and other standard power transmission components.

Select the correct size module from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size UniModule is shown at the intersection of the HP and operating speed.

For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

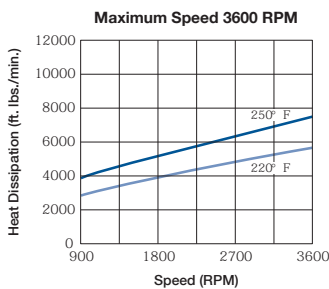
N = Speed in revolutions per minute. (RPM)

F = Cycle rate in cycles per minute (CPM)

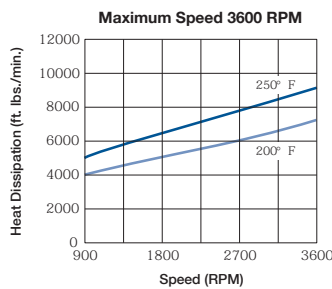
Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Heat Dissipation Curves

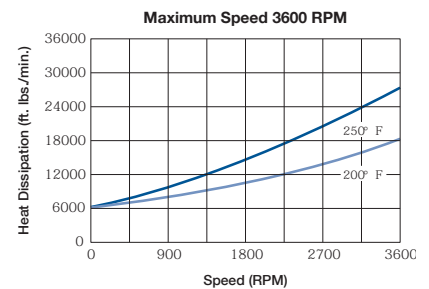
Size 50



Size 100/180



Size 210/215



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart on page 16. Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the technical ratings chart to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

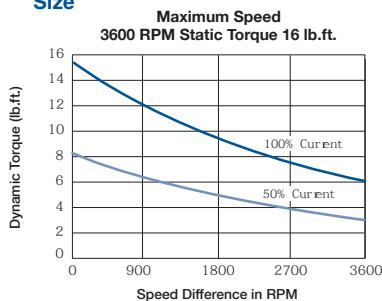
WR2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute. (RPM)

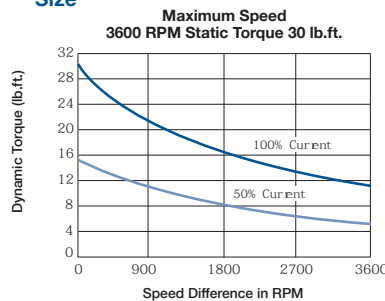
t = Time allowed for the engagement (sec)

C-face Clutch/Power-on Brake Dynamic Torque Curves

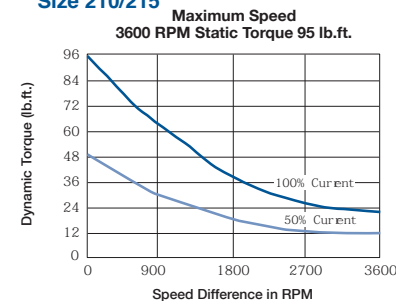
Size



Size



Size 210/215



UM Series UniModule

Specifications (Blue shaded areas indicate GEN 2 design)

| UM Size | Static Torque lb. ft. | Maximum RPM | Voltage DC |
|---------|-----------------------|-------------|--------------|
| 50 | 16 | 3600 | 6, 24, or 90 |
| 100 | 30 | 3600 | 6, 24, or 90 |
| 180 | 30 | 3600 | 6, 24, or 90 |
| 210 | 95 | 3600 | 6, 24, or 90 |
| 215 | 95 | 3600 | 6, 24, or 90 |

3. Accessories

Warner Electric UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

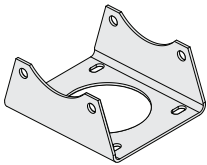
a. Conduit Box

NEMA 4 and UL listed, available in standard and washdown versions.

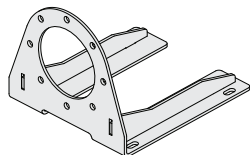


b. Mounting Brackets

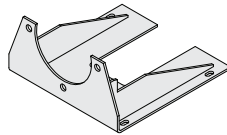
Two styles of mounting brackets are available for simplified installation. The base mount is used with the 2030 and 3040 configurations. A motor mount is also available and provides sturdy support for 1020 and 1040 units and a motor.



Base Mount



Motor Mount
For 50, 100 & 180 sizes



Motor Mount
For 210 & 215 sizes

c. Cover Kit – For sizes 50, 100 & 180



Each cover kit includes two (2) vent covers, two (2) gaskets and four (4) screws needed to convert a vented design into an enclosed design (non-washdown).

4. Select Control

Warner Electric manufactures clutch/brake controls to meet several system functions including:

- On/Off
- Torque adjust
- Over excitation
- Position loop

Many requirements beyond function can impact control selection. See the Controls Section on page 201 for complete information.

| Model No. | | Voltage D.C. | GEN 2 Part No. | Original Part No. |
|--|-------------|--------------|----------------|-------------------|
| UM-1020 w/Pre-installed control | | | | |
| UM50-1020 | w/CBC-150-1 | 90 | 5370-273-230 | 5370-9 |
| UM100-1020 | w/CBC-150-1 | 90 | 5370-273-231 | 5370-10 |
| UM180-1020 | w/CBC-150-1 | 90 | 5370-273-232 | 5370-273-122 |
| UM180-1020 (heavy-duty) | w/CBC-150-1 | 90 | 5370-273-324 | |
| UM210-1020 | w/CBC-150-1 | 90 | | 5371-4 |
| UM215-1020 | w/CBC-150-1 | 90 | | 5371-273-090 |

Ordering Information

Part Numbers

(Blue shaded areas indicate GEN 2 design)

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part No. |
|--|--------------|----------------|-------------------|
| 1020 Motor Clutch/Brake | | | |
| UM-50-1020 | 6 | 5370-273-201 | 5370-273-016 |
| UM-50-1020 | 24 | 5370-273-203 | 5370-273-018 |
| UM-50-1020 | 90 | 5370-273-204 | 5370-273-017 |
| UM-100-1020 | 6 | 5370-273-206 | 5370-273-026 |
| UM-100-1020 | 24 | 5370-273-208 | 5370-273-028 |
| UM-100-1020 | 90 | 5370-273-209 | 5370-273-027 |
| UM-180-1020 | 6 | 5370-273-211 | 5370-273-006 |
| UM-180-1020 | 24 | 5370-273-213 | 5370-273-008 |
| UM-180-1020 | 90 | 5370-273-214 | 5370-273-007 |
| UM-210-1020 | 6 | | 5371-273-002 |
| UM-210-1020 | 24 | | 5371-273-004 |
| UM-210-1020 | 90 | | 5371-273-003 |
| UM-215-1020 | 6 | | 5371-273-076 |
| UM-215-1020 | 24 | | 5371-273-077 |
| UM-215-1020 | 90 | | 5371-273-078 |
| Heavy-Duty Models | | | |
| UM-180-1020 | 90 | 5370-273-323 | |
| UM-180-1020* | 90 | 5370-273-324 | |
| 1040 Motor Clutch Output Clutch | | | |
| UM-50-1040 | 6 | 5370-271-201 | 5370-271-004 |
| UM-50-1040 | 24 | 5370-271-203 | 5370-271-006 |
| UM-50-1040 | 90 | 5370-271-204 | 5370-271-005 |
| UM-100-1040 | 6 | 5370-271-206 | 5370-271-024 |
| UM-100-1040 | 24 | 5370-271-208 | 5370-271-026 |
| UM-100-1040 | 90 | 5370-271-209 | 5370-271-025 |
| UM-180-1040 | 6 | 5370-271-211 | 5370-271-014 |
| UM-180-1040 | 24 | 5370-271-213 | 5370-271-016 |
| UM-180-1040 | 90 | 5370-271-214 | 5370-271-015 |
| UM-210-1040 | 6 | | 5371-271-002 |
| UM-210-1040 | 24 | | 5371-271-004 |
| UM-210-1040 | 90 | | 5371-271-003 |
| UM-215-1040 | 6 | | 5371-271-026 |
| UM-215-1040 | 24 | | 5371-271-027 |
| UM-215-1040 | 90 | | 5371-271-028 |
| 2030 Input Clutch/Brake | | | |
| UM-50-2030 | 6 | 5370-273-216 | 5370-273-021 |
| UM-50-2030 | 24 | 5370-273-218 | 5370-273-023 |
| UM-50-2030 | 90 | 5370-273-219 | 5370-273-022 |
| UM-100-2030 | 6 | 5370-273-221 | 5370-273-031 |
| UM-100-2030 | 24 | 5370-273-223 | 5370-273-033 |
| UM-100-2030 | 90 | 5370-273-224 | 5370-273-032 |
| UM-180-2030 | 6 | 5370-273-226 | 5370-273-011 |
| UM-180-2030 | 24 | 5370-273-228 | 5370-273-013 |
| UM-180-2030 | 90 | 5370-273-229 | 5370-273-012 |
| UM-210-2030 | 6 | | 5371-273-007 |
| UM-210-2030 | 24 | | 5371-273-009 |
| UM-210-2030 | 90 | | 5371-273-008 |
| UM-215-2030 | 6 | | 5371-273-043 |
| UM-215-2030 | 24 | | 5371-273-044 |
| UM-215-2030 | 90 | | 5371-273-045 |

* Includes CBC-150-1

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part No. |
|--|--------------|----------------|-------------------|
| 3040 Input Clutch Output Clutch | | | |
| UM-50-3040 | 6 | 5370-271-216 | 5370-271-009 |
| UM-50-3040 | 24 | 5370-271-218 | 5370-271-011 |
| UM-50-3040 | 90 | 5370-271-219 | 5370-271-010 |
| UM-100-3040 | 6 | 5370-271-221 | 5370-271-029 |
| UM-100-3040 | 24 | 5370-271-223 | 5370-271-031 |
| UM-100-3040 | 90 | 5370-271-224 | 5370-271-030 |
| UM-180-3040 | 6 | 5370-271-226 | 5370-271-019 |
| UM-180-3040 | 24 | 5370-271-228 | 5370-271-021 |
| UM-180-3040 | 90 | 5370-271-229 | 5370-271-020 |
| UM-210-3040 | 6 | | 5371-271-007 |
| UM-210-3040 | 24 | | 5371-271-009 |
| UM-210-3040 | 90 | | 5371-271-008 |
| UM-215-3040 | 6 | | 5371-271-021 |
| UM-215-3040 | 24 | | 5371-271-022 |
| UM-215-3040 | 90 | | 5371-271-023 |

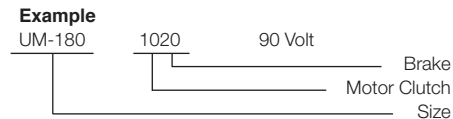
Accessories

| Description | UM Size | Part No. |
|--------------------------------|------------|--------------|
| Conduit Box | All sizes | 5370-101-042 |
| Base Mount Kit for 2030, 3040 | 50/100 | 5370-101-004 |
| | 180 | 5370-101-002 |
| | 210/215 | 5371-101-001 |
| Motor Mount Kit for 1020, 1040 | 50/100 | 5370-101-078 |
| | 180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| Cover Kit | 50/100/180 | 5370-101-076 |

How to Order

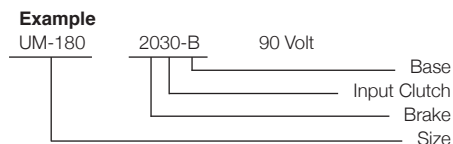
Motor or Reducer Mounted

Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Power-off brake UniModules are found on page 106. Order optional conduit box if desired.



Base Mounted

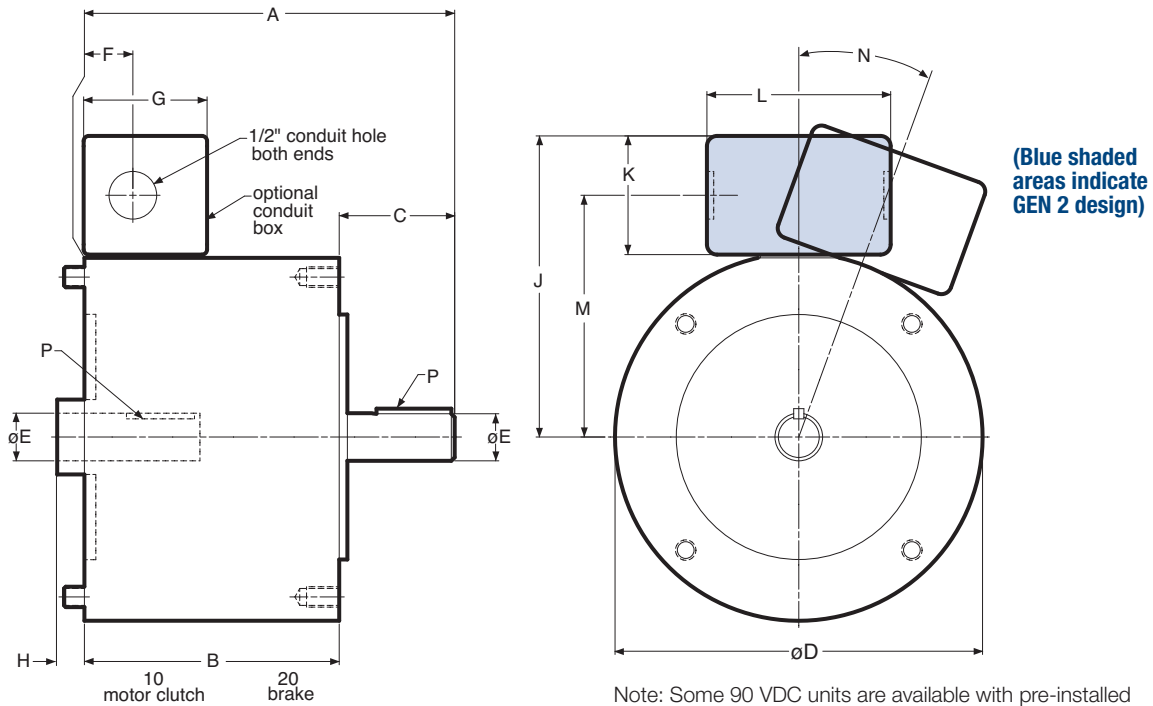
Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Power-off brake UniModules are found on page 106. Order optional conduit box if desired.



Select Appropriate Power Supply/Control.

UM Series UniModule

UM-1020 Motor Clutch/Brake Combination



Note: Some 90 VDC units are available with pre-installed controls. On all other modules, conduit box is optional and is ordered separately.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|-------|-------|-------|-------|-------|------|-------|------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | — |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .890 | 2.267 | — |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | — |
| 210 | 8.891 | 5.922 | 2.500 | 9.250 | 1.125 | .500 | 2.267 | .500 |
| 215 | 9.391 | 5.922 | 3.000 | 9.250 | 1.375 | .500 | 2.267 | .500 |

| Size | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-----|-------------|
| 50 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 100 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 1/4 x 1/4 |
| 215 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 5/16 x 5/16 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | 213C/182TC 215C/184TC |
| 215 | 6, 24, 90 | 95 | 3600 | 213TC/215TC |

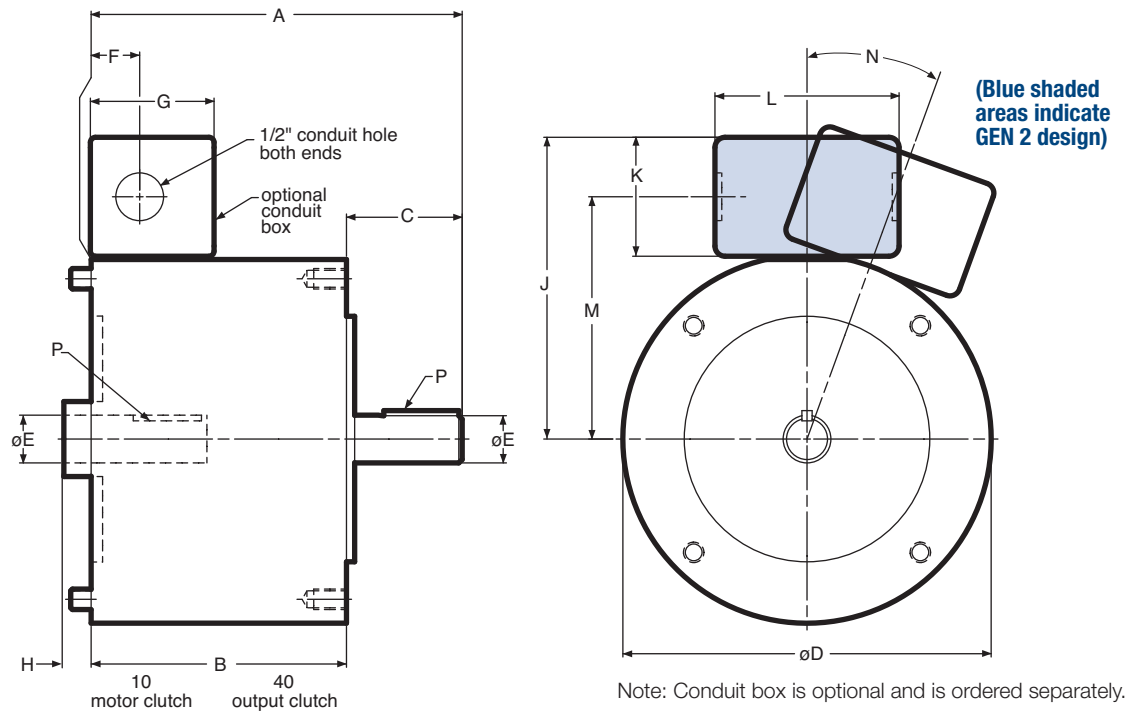
* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

** UM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

UM-1040 Motor Clutch/Output Clutch Combination



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|-------|-------|-------|-------|-------|------|-------|------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | — |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .890 | 2.267 | — |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | — |
| 210 | 8.891 | 5.922 | 2.500 | 9.250 | 1.125 | .500 | 2.267 | .500 |
| 215 | 9.391 | 5.922 | 3.000 | 9.250 | 1.375 | .500 | 2.267 | .500 |

| Size | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-----|-------------|
| 50 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 100 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 1/4 x 1/4 |
| 215 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 5/16 x 5/16 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | 213C/182TC 215C/184TC |
| 215 | 6, 24, 90 | 95 | 3600 | 213TC/215TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

** UM-100 size is recommended for motors 1 HP and larger.

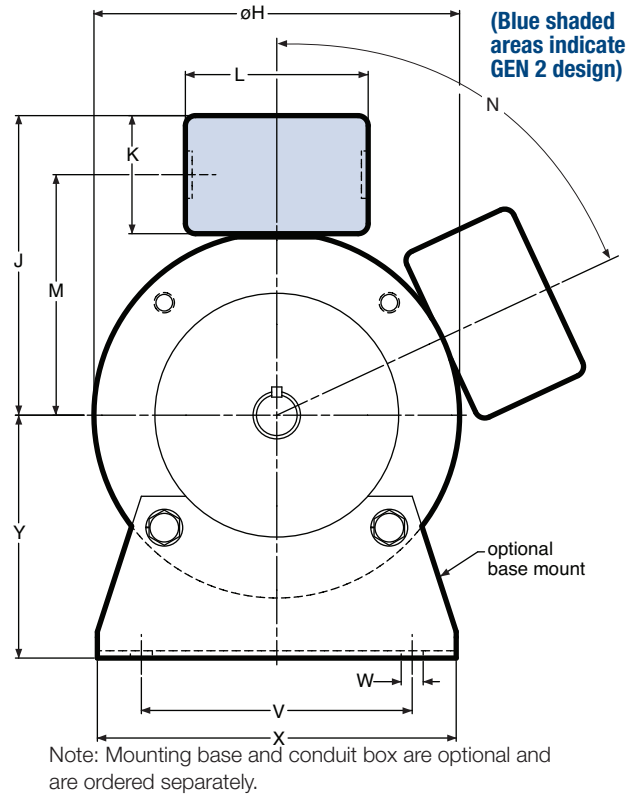
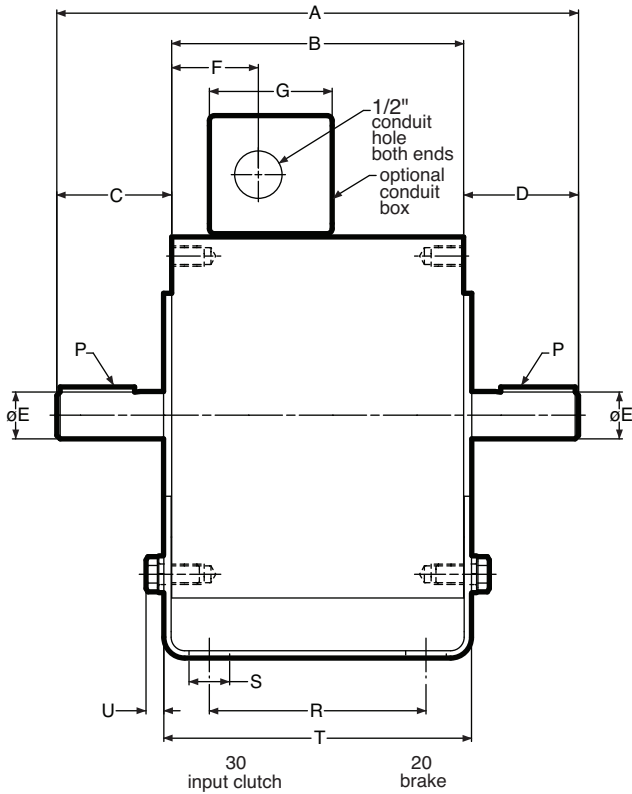
For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

UM Series UniModule

UM-2030 Input Clutch/Brake Combination

UM-2030-B Input Clutch/Brake Combination – Base Mounted



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L | M |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |
| 215 | 12.969 | 7.719 | 2.500 | 2.500 | 1.375 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |

| Size | N | P | R | S | T | U | V | W | X | Y |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 100 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 65° | 1/4 x 1/4 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |
| 215 | 65° | 5/16 x 5/16 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

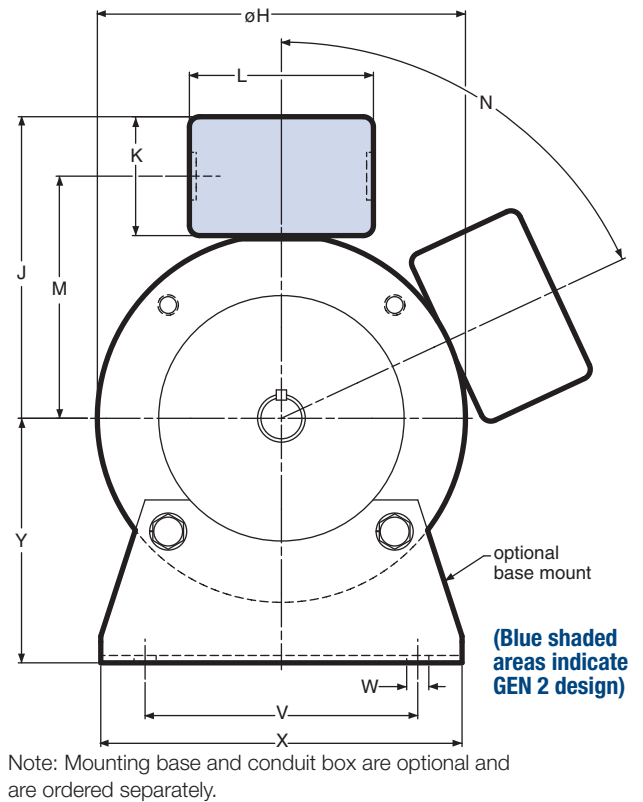
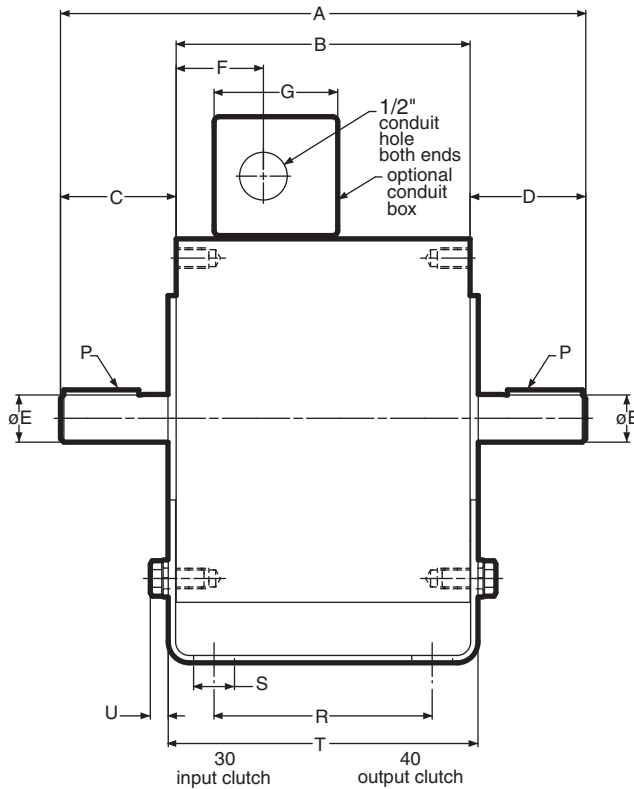
Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM |
|------------|------------|-----------------------|----------|
| 50 | 6, 24, 90 | 16 | 3600 |
| 100 | 6, 24, 90 | 30 | 3600 |
| 180 | 6, 24, 90 | 30 | 3600 |
| 210 | 6, 24, 90 | 95 | 3600 |
| 215 | 6, 24, 90 | 95 | 3600 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

UM-3040 Input Clutch/Output Clutch Combination UM-3040-B Input Clutch/Output Clutch Combination—Base Mounted



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L | M |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |
| 215 | 12.969 | 7.719 | 2.500 | 2.500 | 1.375 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |

| Size | N | P | R | S | T | U | V | W | X | Y |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 100 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 65° | 1/4 x 1/4 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |
| 215 | 65° | 5/16 x 5/16 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM |
|------------|------------|-----------------------|----------|
| 50 | 6, 24, 90 | 16 | 3600 |
| 100 | 6, 24, 90 | 30 | 3600 |
| 180 | 6, 24, 90 | 30 | 3600 |
| 210 | 6, 24, 90 | 95 | 3600 |
| 215 | 6, 24, 90 | 95 | 3600 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

EM Series Electro Module

Individual Clutch or Brake Module Combine to Comprise a Clutch, Brake or Clutch/Brake Combination

Electro Modules are individual clutch or brake units which are assembled together to comprise a clutch, brake, or clutch/brake combination. Electro Modules can be bolted directly to a NEMA C-face motor or reducer or they can be base mounted for stand alone operation. Electro Modules offer the ultimate in clutch/brake convenience. They are easy and quick to install and require no lubrication or maintenance for life.

Bolt-it-down and wire-it-up ... it's ready to go!

- Modular design flexibility
- 1/4 to 7-1/2 HP at 1800 RPM
- Outstanding controllability
- Fast cycling
- Smooth starts and stops
- Accurate
- Bidirectional
- Consistent performance
- Complete control capability

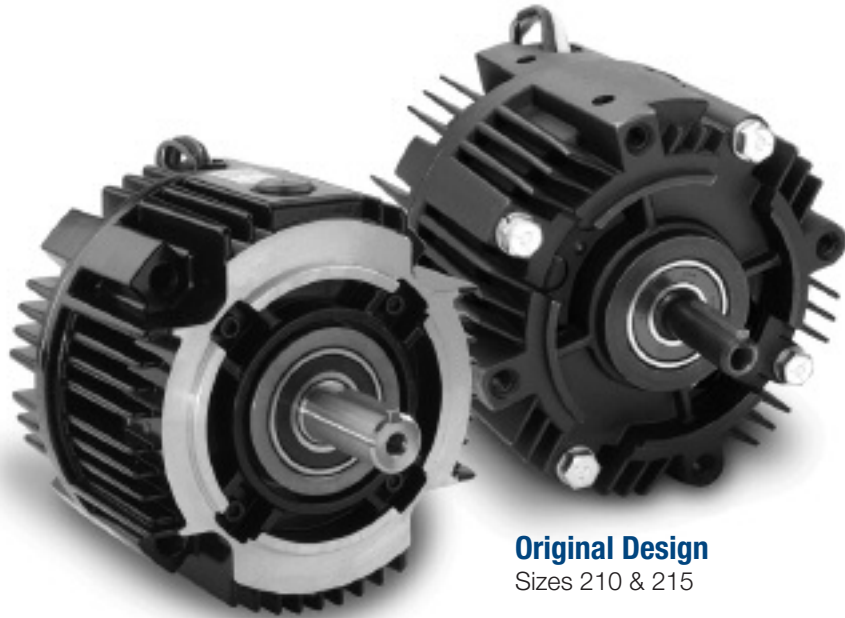
Selection Flexibility Clutch/Brake Combination

A wide range of module combinations for use with motors, reducers and other standard power transmission components is available. The flexibility of Electro Module enables you to pick the exact combination of function and design.

Power-On Applications

Electro Modules for power-on applications are purchased as individual clutches and brakes to be assembled for C-face, flange, or base mounting applications.

Power-Off (Electrically Released)



GEN 2 Design

Sizes 50, 100 & 180

Original Design

Sizes 210 & 215

Applications

Electrically released operation is the primary feature of power-off Electro Module brakes. They can be used as brakes, motor brakes and in combination with clutches. See page 106 for complete information.

Selection

The correct size can be determined from easy-to-use selection charts based on NEMA frame sizes or horsepower and shaft speed. Examples show the right way to order the Electro Module required.

Controls

Warner Electric controls assure that you

get the maximum performance from your Electro Module. See page 201.

Modular Components

Clutch Modules



10 Motor Clutch

Fan cooled for long life and consistent performance. See page 30.



30 Input Clutch

Fan cooled. Sealed coil. Twin bearing mounted shaft maintains tight concentricities. See page 33.



40 Output Clutch

Autogap™ automatically adjust armature for wear. Does not have a coil – use in combination with a 10 Motor Clutch or 30 Input Clutch module. See page 34.

Brake Modules



20 Brake

Bolts directly to C-face components. See page 31.



20MB Motor Brake

Does not have a shaft. Has end cap. See page 32.

Clutch Combinations



10/40 Motor Clutch/Output Clutch

Use for clutch only applications. Has hollow bore input for mounting directly to C-face motors. Shaft and C-face on output side of unit accommodates reducer, parallel drive or coupling. Basic components are field, rotor and armature. See page 36.



30/40 Input Clutch/Output Clutch

Use for clutch only applications. Features dual C-faces and shafts. Unit input from parallel drive or coupling. Output to reducer. Basic components are field, rotor and armature. See page 38.



30/40-B Input Clutch/Output Clutch-Base Mounted

Base mounting allows the clutch units to be utilized as a separate drive unit. Attach with pulleys, sprockets, etc. See page 38.

Clutch/Brake Combinations



10/20 Motor Clutch/Brake

Use for clutch/brake applications. Hollow bore input. Shaft on output side. Basic components are field, rotor, 2 armatures and power-on magnet. See page 35.



20/30 Brake/Input Clutch

Use for clutch/brake applications. Features dual C-faces and shafts. Input from parallel drive or coupling. Output to reducer. Basic components are field, rotor, 2 armatures and power-on magnet. See page 37.



20/30-B Brake/Input Clutch-Base Mounted

Stand alone units attach with pulleys, sprockets, etc. See page 37.

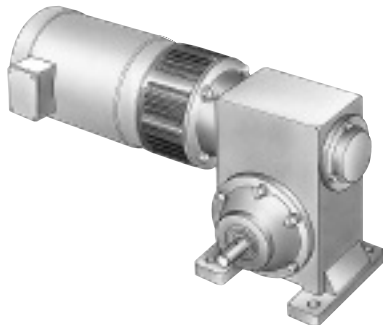
EM Series Electro Module

Selection

Electro Module clutch or brake units may be mounted directly to NEMA C-face motors and reducers, or can be base mounted.

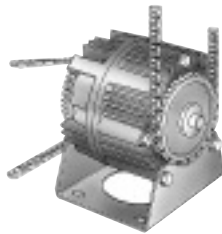
1. Select Configuration

a. NEMA C-face Mounting



Based on the NEMA C-face frame size of the prime mover, select the correct clutch or brake module size from the Frame Size Selection chart. Size 100 houses the components of the size 180 in a size 50 frame, while size 215 incorporates size 210 components.

b. Base Mounting



Electro Module assemblies may be mounted as separate drive units driven from the prime mover by V-belts, chain and sprockets, couplings, timing belts and other standard power transmission components.

Select the correct size module from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size Electro Module is shown at the intersection of the HP and operating speed.

For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Frame Size Selection

| NEMA Frame Size | Electro Module Size |
|--------------------------|---------------------|
| 56C/48Y | EM-50* EM-100** |
| 182C/143TC 184C/145TC | EM-180 |
| 213C/182TC | EM-210 |
| 215C/184TC | EM-215 |
| 213TC/215TC | EM-215 |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

** UM-100 size is recommended for motors 1 HP and larger.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.2)

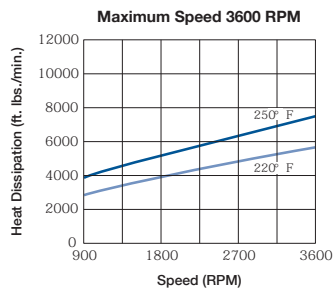
N = Speed in revolutions per minute (RPM)

F = Cycle rate in cycles per minute (CPM)

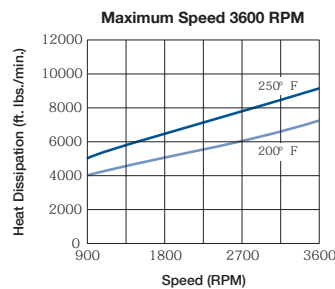
Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Heat Dissipation Curves

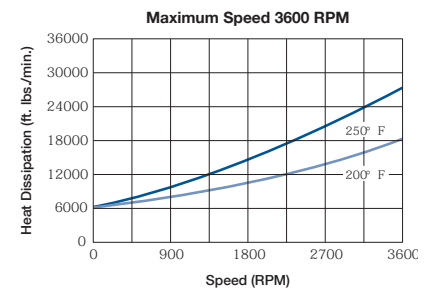
Size 50



Size 100/180



Size 210/215



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart.

Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the Specifications Table to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

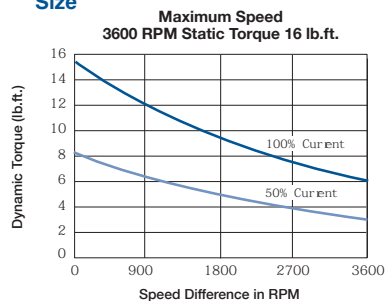
WR2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.2)

N = Speed in revolutions per minute (RPM)

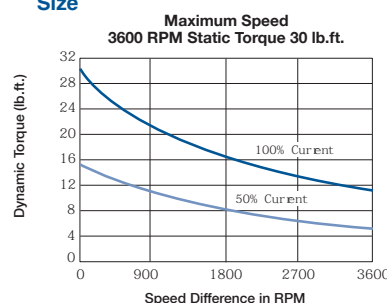
t = Time allowed for the engagement (sec)

C-face Clutch/Power-on Brake Dynamic Curves

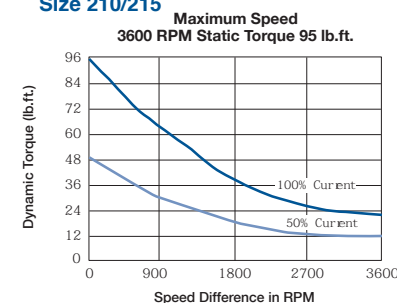
Size



Size



Size 210/215



EM Series Electro Module

Specifications (Blue shaded areas indicate GEN 2 design)

| EM Size | Static Torque lb. ft. | Maximum RPM | Voltage D.C. |
|---------|-----------------------|-------------|--------------|
| 50 | 16 | 3600 | 6, 24, or 90 |
| 100 | 30 | 3600 | 6, 24, or 90 |
| 180 | 30 | 3600 | 6, 24, or 90 |
| 210 | 95 | 3600 | 6, 24, or 90 |
| 215 | 95 | 3600 | 90 |

3. Accessories

Warner Electric Electro Modules can be fitted with several accessories to extend their capacity and ease of mounting.

a. Conduit Box

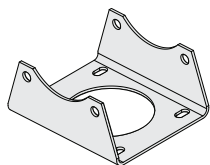
NEMA 4 and UL listed, available in standard and washdown versions.



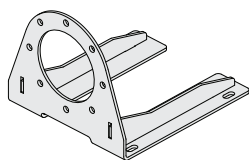
b. Mounting Brackets

Two styles of mounting brackets are available for simplified installation.

The base mount is used with the 20/30 and 30/40 configurations. A motor mount is also available and provides sturdy support for 20, 10/20 and 10/40 units and motor.

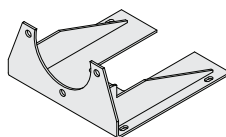


Base Mount



Motor Mount

For 50, 100 & 180 sizes



Motor Mount

For 210 & 215 sizes

c. Cover Kit – For sizes 50, 100 & 180



Each cover kit includes two (2) vent covers, two (2) gaskets and four (4) screws needed to convert a vented design into an enclosed design. For brake only modules, a cover plate is included to enclose the back of the brake.

4. Select Control

Warner Electric manufactures clutch/brake controls to meet several system functions including:

- On/Off
- Torque adjust
- Over excitation
- Position loop

Many requirements beyond function can impact control selection. See the Controls Section on page 201.

Ordering Information

Part Numbers

(Blue shaded areas indicate GEN 2 design)

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part No. |
|-------------------------------|--------------|----------------|-------------------|
| 10 Motor Clutch Module | | | |
| EM-50-10 | 6 | 5370-270-201 | 5370-270-020 |
| EM-50-10 | 24 | 5370-270-203 | 5370-270-030 |
| EM-50-10 | 90 | 5370-270-204 | 5370-270-015 |
| EM-100-10 | 6 | 5370-270-206 | 5370-270-045 |
| EM-100-10 | 24 | 5370-270-208 | 5370-270-056 |
| EM-100-10 | 90 | 5370-270-209 | 5370-270-046 |
| EM-180-10 | 6 | 5370-270-211 | 5370-270-021 |
| EM-180-10 | 24 | 5370-270-213 | 5370-270-055 |
| EM-180-10 | 90 | 5370-270-214 | 5370-270-017 |
| EM-210-10 | 6 | | 5371-270-011 |
| EM-210-10 | 24 | | 5371-270-027 |
| EM-210-10 | 90 | | 5371-270-009 |

| 20 Brake Module | | | |
|------------------------|----|--------------|--------------|
| EM-50-20 | 6 | 5370-169-201 | 5370-169-043 |
| EM-50-20 | 24 | 5370-169-203 | 5370-169-045 |
| EM-50-20 | 90 | 5370-169-204 | 5370-169-042 |
| EM-100-20 | 6 | 5370-169-206 | 5370-169-040 |
| EM-100-20 | 24 | 5370-169-208 | 5370-169-072 |
| EM-100-20 | 90 | 5370-169-209 | 5370-169-041 |
| EM-180-20 | 6 | 5370-169-211 | 5370-169-050 |
| EM-180-20 | 24 | 5370-169-213 | 5370-169-071 |
| EM-180-20 | 90 | 5370-169-214 | 5370-169-051 |
| EM-210-20 | 6 | | 5371-169-022 |
| EM-210-20 | 24 | | 5371-169-034 |
| EM-210-20 | 90 | | 5371-169-023 |
| EM-215-20 | 90 | | 5371-169-076 |

| 20MB Motor Brake | | | |
|-------------------------|----|--------------|--------------|
| EM-50-20MB | 6 | 5370-169-216 | 5370-169-047 |
| EM-50-20MB | 24 | 5370-169-218 | 5370-169-062 |
| EM-50-20MB | 90 | 5370-169-219 | 5370-169-048 |
| EM-180-20MB | 6 | 5370-169-221 | 5370-169-053 |
| EM-180-20MB | 24 | 5370-169-223 | 5370-169-073 |
| EM-180-20MB | 90 | 5370-169-224 | 5370-169-054 |
| EM-210-20MB | 6 | | 5371-169-025 |
| EM-210-20MB | 24 | | 5371-169-035 |
| EM-210-20MB | 90 | | 5371-169-026 |

| 30 Input Clutch Module | | | |
|-------------------------------|----|--------------|--------------|
| EM-50-30 | 6 | 5370-270-216 | 5370-270-019 |
| EM-50-30 | 24 | 5370-270-218 | 5370-270-052 |
| EM-50-30 | 90 | 5370-270-219 | 5370-270-016 |
| EM-100-30 | 6 | 5370-270-221 | 5370-270-047 |
| EM-100-30 | 24 | 5370-270-223 | 5370-270-054 |
| EM-100-30 | 90 | 5370-270-224 | 5370-270-048 |
| EM-180-30 | 6 | 5370-270-226 | 5370-270-049 |
| EM-180-30 | 24 | 5370-270-228 | 5370-270-053 |
| EM-180-30 | 90 | 5370-270-229 | 5370-270-050 |
| EM-210-30 | 6 | | 5371-270-023 |
| EM-210-30 | 24 | | 5371-270-026 |
| EM-210-30 | 90 | | 5371-270-024 |

| Model No. | Voltage D.C. | GEN 2 Part No. | Original Part No. |
|--------------------------------|--------------|----------------|-------------------|
| 40 Output Clutch Module | | | |
| EM-50-40 | | 5370-536-200 | 5370-536-008 |
| EM-100-40 | | 5370-536-201 | 5370-536-007 |
| EM-180-40 | | 5370-536-202 | 5370-536-009 |
| EM-210-40 | | | 5371-536-005 |

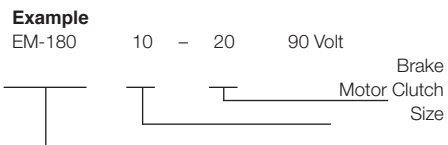
Accessories

| Description | EM Size | Part No. |
|------------------------------------|-------------------------|--------------|
| Conduit Box | All sizes | 5370-101-042 |
| Base Mount Kit for 2030, 3040 | 50/100 | 5370-101-004 |
| | 180 | 5370-101-002 |
| | 210/215 | 5371-101-001 |
| Motor Mount Kit for 20, 1020, 1040 | 50/100 | 5370-101-078 |
| | 180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| Cover Kit | 50/100/180 | 5370-101-076 |
| | 50/100/180 (20 or 20MB) | 5370-101-082 |

How to Order

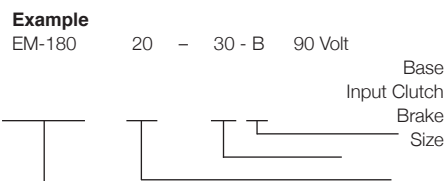
Motor or Reducer Mounted

Simply combine the size number with the configuration of the modular combination from page 25. Specify voltage. See chart for specific part numbers. Power-off brake Electro Modules are found on page 106. Order optional conduit box if desired.



Base Mounted

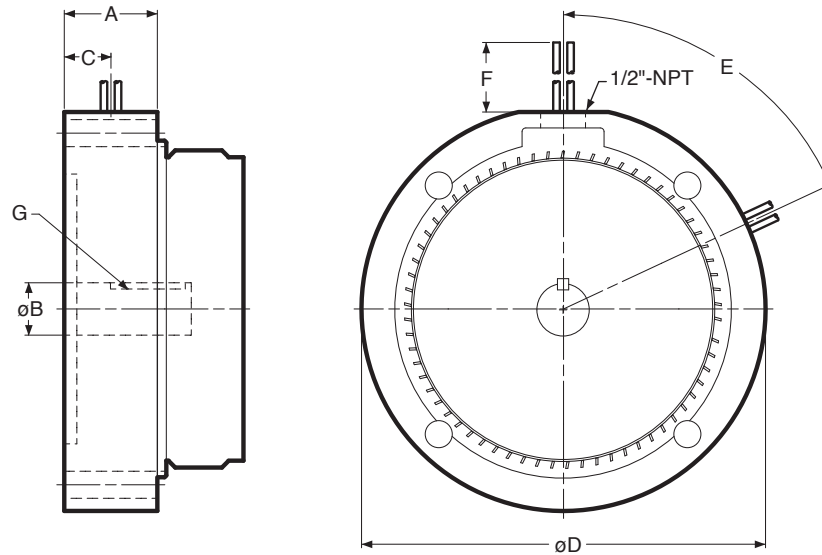
Simply combine the size number with the configuration of the modular combination from page 25. Specify voltage. See chart for specific part numbers. Power-off brake Electro Modules are found on page 106. Order optional conduit box if desired.



Select Appropriate Power Supply/Control. See the Controls Section beginning on page 201.

EM Series Electro Module

10 Motor Clutch Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G |
|------|-------|-------|------|-------|-----|----|-------------|
| 50 | 1.555 | .625 | .780 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 1.555 | .625 | .780 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 1.555 | .875 | .780 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 1.313 | 1.125 | .700 | 9.250 | 65° | 36 | 1/4 x 1/4 |

Specifications (Blue shaded areas indicate GEN 2 design)

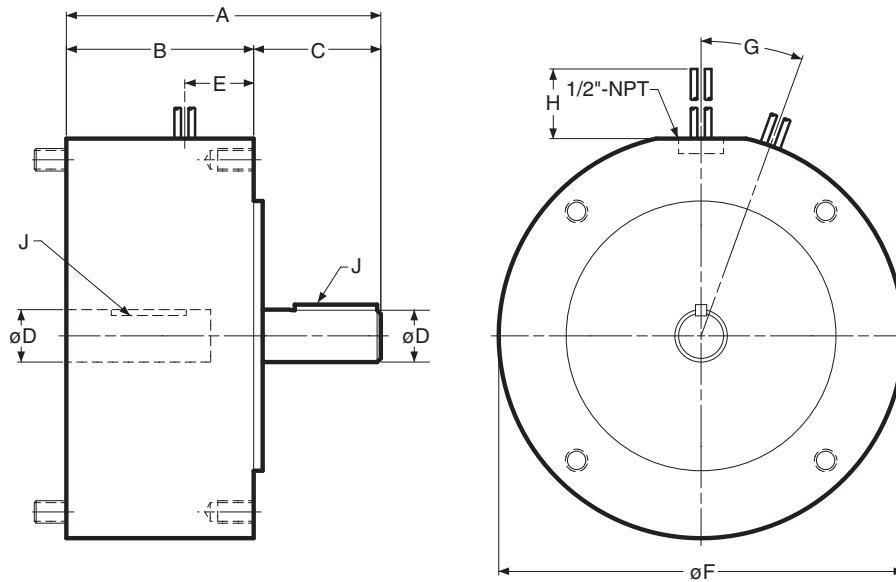
| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Inertia-WR ² (lb.ft. ²) | Weight (lbs) | NEMA Frame Size |
|------------|------------|-----------------------|----------|--|--------------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | .020 | 6.4 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | .046 | 7.6 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | .046 | 7.6 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | .188 | 9.1 | 213C/182TC 215C/184TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

** UM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 5.165 | 3.125 | 2.040 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 5.186 | 3.125 | 2.061 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 5.246 | 3.125 | 2.121 | .875 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 7.578 | 4.609 | 2.500 | 1.125 | 1.812 | 9.250 | 20° | 36 | 1/4 x 1/4 |
| 215 | 8.078 | 4.609 | 3.000 | 1.375 | 1.812 | 9.250 | 20° | 36 | 5/16 x 5/16 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Armatures | Inertia-WR ² Arm. Hub | Shaft | Weight (lbs) | NEMA Frame Size |
|------------|------------|-----------------------|----------|-----------|----------------------------------|-------|--------------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | .014 | .002 | .001 | 9.2 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | .036 | .003 | .002 | 11.2 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | .036 | .003 | .002 | 11.2 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | .162 | .021 | .017 | 21.5 | 213C/182TC 215C/184TC |
| 215 | 90 | 95 | 3600 | .162 | .021 | .019 | 22 | 213TC/215TC*** |

* For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.

** EM-100 size is recommended for motors 1 HP and larger.

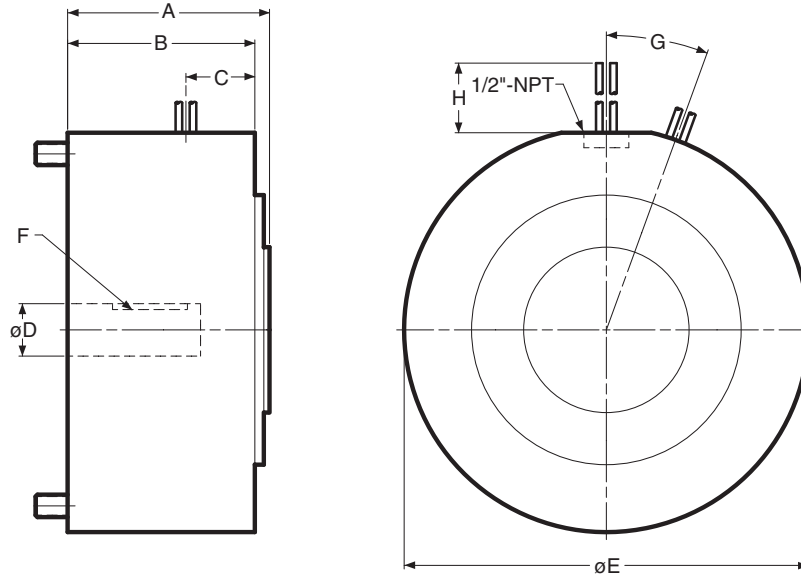
*** For 7-1/2 HP max.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

EM Series Electro Module

20MB Motor Brake Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|-------|-------|-------|-------|-------|-------------|-----|----|
| 50 | 3.368 | 3.125 | 1.150 | .625 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 180 | 3.368 | 3.125 | 1.150 | .875 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 210 | 5.150 | 4.610 | 1.812 | 1.125 | 9.250 | 1/4 x 1/4 | 20° | 36 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Armatures | Inertia-WR ² Arm. Hub | Input Hub | Weight (lbs) | NEMA Frame Size |
|------------|------------|-----------------------|----------|-----------|----------------------------------|-----------|--------------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | .014 | .002 | .001 | 9.2 | 56C/48Y* |
| 180 | 6, 24, 90 | 30 | 3600 | .036 | .003 | .002 | 11.2 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | .162 | .021 | .017 | 21.5 | 213C/182TC 215C/184TC |

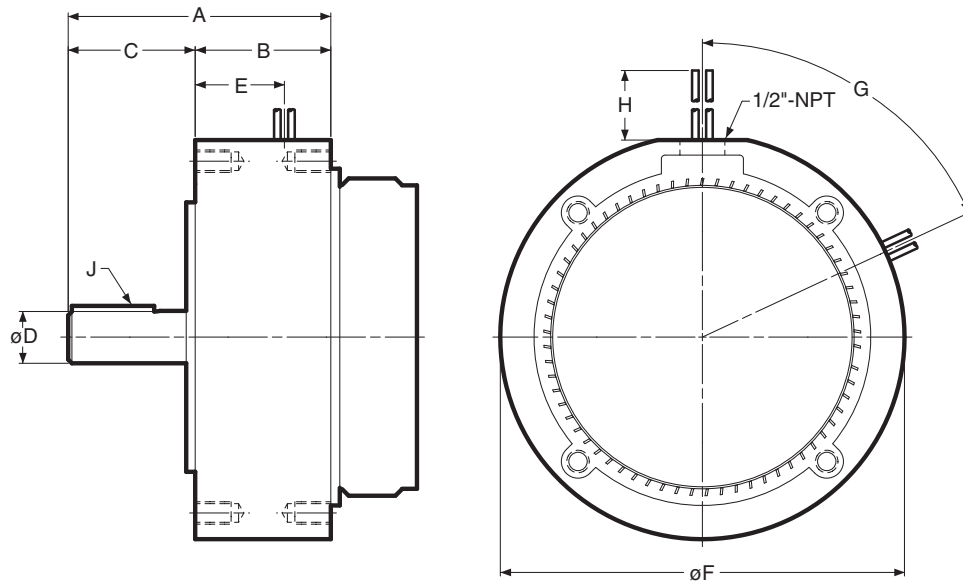
*For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.

For standard NEMA frame dimensions, see page 187.

Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

EM Series Electro Module

30 Input Clutch Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 4.327 | 2.265 | 2.040 | .625 | 1.490 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 4.326 | 2.265 | 2.061 | .625 | 1.490 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 4.386 | 2.265 | 2.121 | .875 | 1.490 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 5.391 | 2.438 | 2.500 | 1.125 | 1.812 | 9.250 | 65° | 36 | 1/4 x 1/4 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Inertia-WR ² | | Weight (lbs) | NEMA Frame Size |
|------------|------------|-----------------------|----------|-------------------------|-------|--------------|--------------------------|
| | | | | Rotor | Shaft | | |
| 50 | 6, 24, 90 | 16 | 3600 | .020 | .001 | 9.2 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | .046 | .002 | 10.5 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | .046 | .002 | 10.5 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | .188 | .017 | 19.8 | 213C/182TC 215C/184TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.

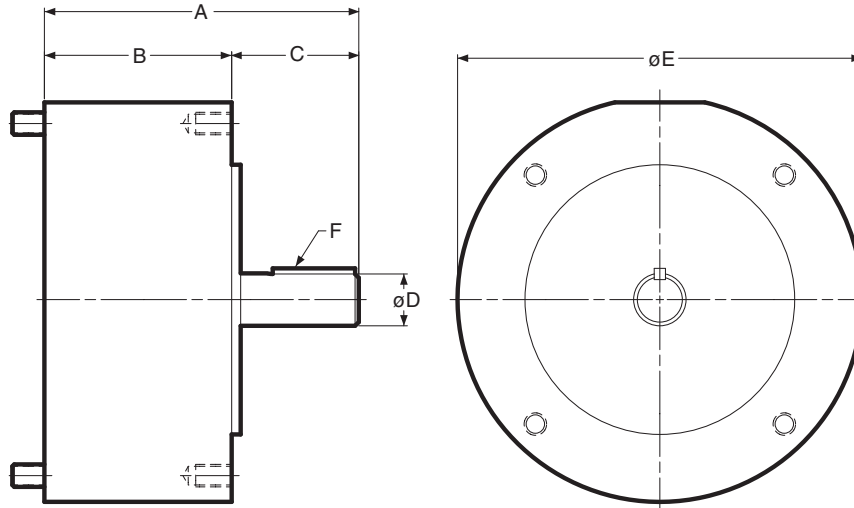
** EM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EM Series Electro Module

40 Output Clutch Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F |
|------|-------|-------|-------|-------|-------|-------------|
| 50 | 5.165 | 3.125 | 2.040 | .625 | 6.750 | 3/16 x 3/16 |
| 100 | 5.186 | 3.125 | 2.061 | .625 | 6.750 | 3/16 x 3/16 |
| 180 | 5.246 | 3.125 | 2.121 | .875 | 6.750 | 3/16 x 3/16 |
| 210 | 7.578 | 4.609 | 2.500 | 1.125 | 9.250 | 1/4 x 1/4 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Armatures | Inertia-WR ² Arm. Hub | Shaft | Weight (lbs) | NEMA Frame Size |
|------------|------------|-----------------------|----------|-----------|-------------------------------------|-------|--------------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | .007 | .002 | .001 | 7.6 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | .018 | .003 | .002 | 9.0 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | .018 | .003 | .002 | 9.0 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | .181 | .021 | .017 | 15.2 | 213C/182TC 215C/184TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.

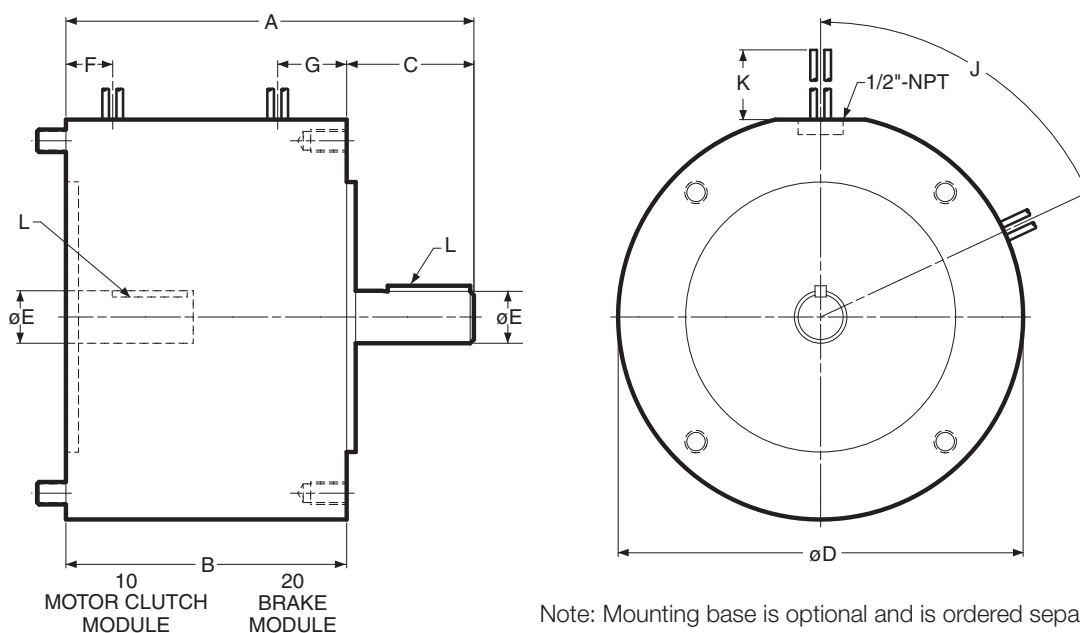
** EM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EM Series Electro Module

EM-10/20 Motor Clutch/Brake Combination



Note: Mounting base is optional and is ordered separately. Motor Clutch (10) and Brake (20) are ordered separately.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | J | K | L | NEMA Frame Size |
|------|-------|-------|-------|-------|-------|------|-------|-----|----|-------------|--------------------------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 56C/48Y* |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 56C/48Y** |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 182C/143TC 184C/145TC |
| 210 | 8.891 | 5.922 | 2.500 | 9.250 | 1.125 | .700 | 1.812 | 65° | 36 | 1/4 x 1/4 | 213C/182TC 215C/184TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.

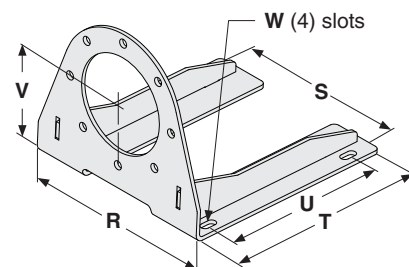
** EM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Motor Mount (M) Dimensions (Blue shaded areas indicate GEN 2 design)

For use with 1020, 1040, 20, 20 FBB and 1020 FBC Combinations.

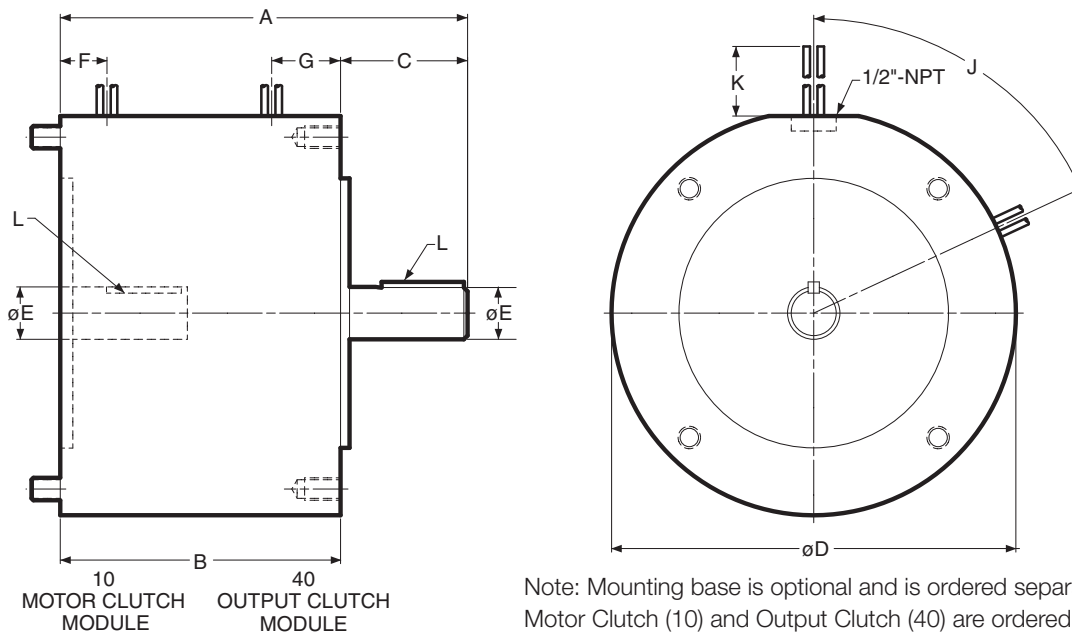
| Size | R | S | T | U | V | W | Part No. |
|---------|--------|--------|--------|-------|-------|-------------|--------------|
| 50/100 | 9.250 | 8.250 | 10.500 | 8.000 | 3.500 | .800 x .406 | 5370-101-078 |
| 180 | 9.250 | 8.250 | 10.500 | 8.000 | 4.500 | .800 x .406 | 5370-101-079 |
| 210/215 | 11.500 | 10.500 | 12.000 | 9.000 | 5.250 | .750 x .409 | 5371-101-012 |



Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EM Series Electro Module

EM-10/40 Motor Clutch/Output Clutch Combination



Note: Mounting base is optional and is ordered separately.
Motor Clutch (10) and Output Clutch (40) are ordered separately.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | J | K | L | NEMA Frame Size |
|------|-------|-------|-------|-------|-------|------|-------|-----|----|-------------|--------------------------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 56C/48Y* |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 56C/48Y** |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .780 | 1.150 | 0° | 36 | 3/16 x 3/16 | 182C/143TC 184C/145TC |
| 210 | 8.891 | 5.922 | 2.500 | 9.250 | 1.125 | .700 | 1.812 | 65° | 36 | 1/4 x 1/4 | 213C/182TC 215C/184TC |

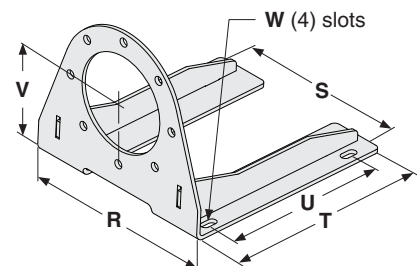
* For 56C/48Y Frame motors 3/4 HP and smaller the EM-100 size may be used where extended life is desirable.
** EM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Motor Mount (M) Dimensions (Blue shaded areas indicate GEN 2 design)

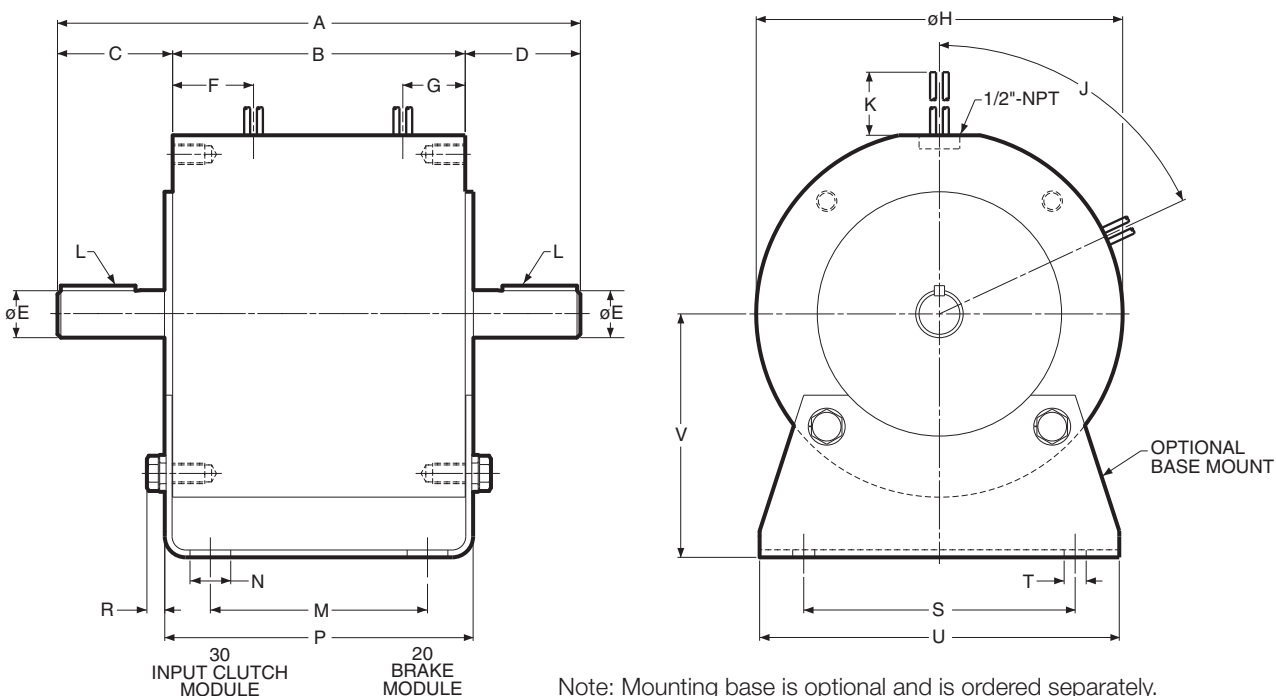
For use with 1020, 1040, 20, 20 FBB and 1020 FBC Combinations.

| Size | R | S | T | U | V | W | Part No. |
|---------|--------|--------|--------|-------|-------|-------------|--------------|
| 50/100 | 9.250 | 8.250 | 10.500 | 8.000 | 3.500 | .800 x .406 | 5370-101-078 |
| 180 | 9.250 | 8.250 | 10.500 | 8.000 | 4.500 | .800 x .406 | 5370-101-079 |
| 210/215 | 11.500 | 10.500 | 12.000 | 9.000 | 5.250 | .750 x .409 | 5371-101-012 |



Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

EM-20/30 Brake/Input Clutch Combination EM-20/30-B Brake/Input Clutch Combination – Base Mounted



Note: Mounting base is optional and is ordered separately.
Input Clutch (30) module and Brake Module (20) are ordered separately.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 1.812 | 9.250 | 65° | 36 | 1/4 x 1/4 |

| Size | M | N | P | R | S | T | U | V |
|------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 100 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

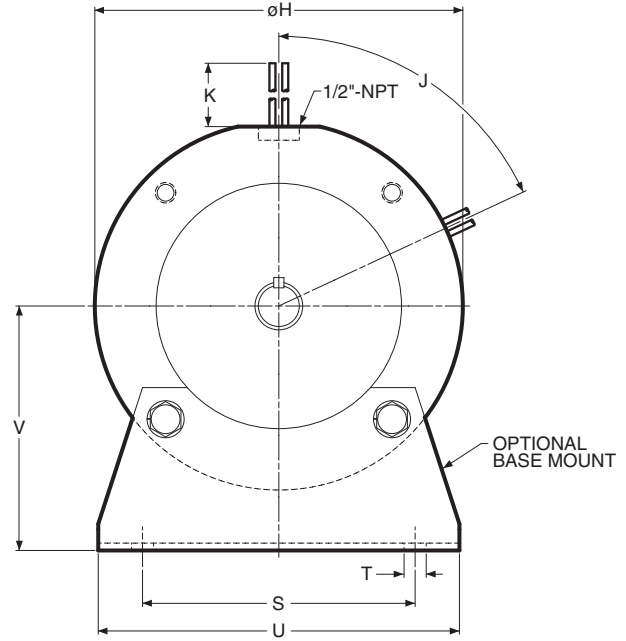
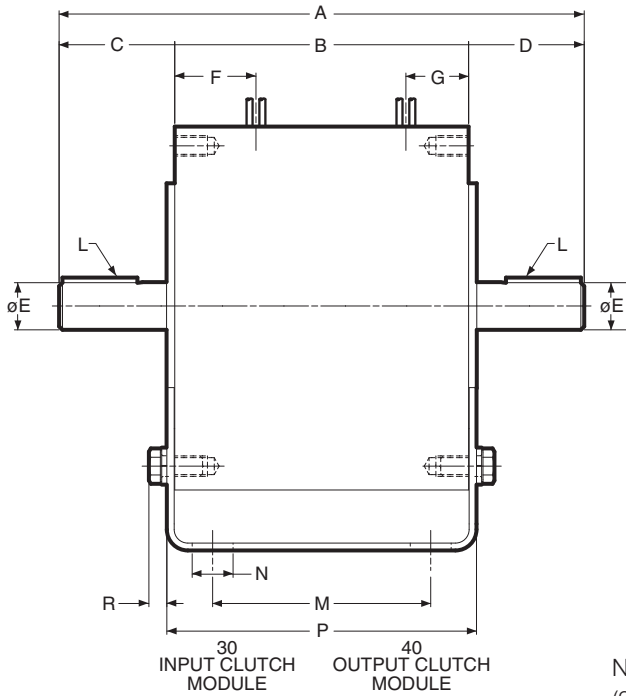
For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

EM Series Electro Module

EM-30/40 Input Clutch/Output Clutch Combination

EM-30/40-B Input Clutch/Output Clutch Combination – Base Mounted



Note: Mounting base is optional and is ordered separately. Input Clutch (30) module and Output Clutch (40) are ordered separately.

Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.490 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 1.812 | 9.250 | 65° | 36 | 1/4 x 1/4 |

| Size | M | N | P | R | S | T | U | V |
|------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 100 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

Contamination-Proof Design

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.

Totally Enclosed Version

The Enclosed Electro Module packages the hardworking components from EM products into a totally enclosed housing. This rugged housing keeps wear particles in and contaminants out and provides quiet operation. When enclosed, units are suitable for most industrial applications and tolerate infrequent, light washing.

- Keeps contaminants out
- Keeps wear particles in
- Quiet operation
- Finned for heat dissipation
- UL listed when optional conduit box is installed

To convert any Gen 2 Electro Module 50, 100, and 180 sizes to an enclosed model purchase optional Cover Kit

(part number 5370-101-076)

(part number 5370-101-082 for brake only)

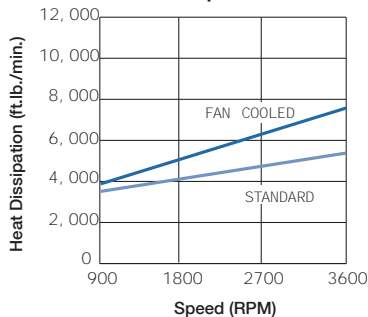
Enclosed Electro Module (10-20, 10-40, 20-30, 30-40)

An optional cover kit (part number 5370-101-076) can be purchased separately to enclose the open vents in the housing. Each cover kit includes two vent covers, two gaskets and four screws needed to convert a vented Electro Module to an enclosed design (non-washdown).



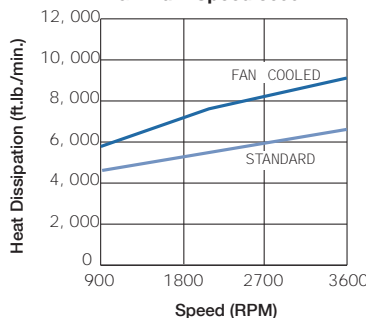
EUM-50

Maximum Speed 3600 RPM



EUM-100/180

Maximum Speed 3600 RPM



Enclosed Electro Module-Brake Only (20 or 20MB)

An optional cover kit (part number 5370-101-082) can be purchased separately to enclose the open vents in the housing and a cover plate to close off the back of the module. Each cover kit includes two vent covers, two gaskets, four screws and one cover plate needed to convert a vented Electro Module 20 to an enclosed design (non-washdown).



NOTE:

Enclosed option is not available for existing 210 & 215 size Electro Modules (EM)

UM Series Smooth-Start UniModules

Warner Electric Smooth-Start™ UniModules are designed for applications that require a softer than standard engagement. Through the use of LK friction material, the Smooth-Start design provides reduced torque to provide a less aggressive engagement, without suffering a loss of overall life due to the longer slip times.

When used with an adjustable power supply such as the CBC 300 or CBC 500/550, the Smooth-Start designs can provide a soft engagement that can be adjusted to meet specific application needs.



Smooth-Start™ UniModules

Warner Electric's new Smooth-Start UniModules are offered in 90 volt configurations as listed below. If you require another voltage, size or mounting configuration, please contact Warner Electric for assistance.

| UniModule Size | NEMA Frame | Max. RPM | Static Torque (lb-ft) | Voltage (DC) | Original Part Number | GEN2 Part Number |
|----------------|--------------------------|----------|-----------------------|--------------|----------------------|------------------|
| 50 | 56C/48Y | 3600 | 10 | 90 | 5370-273-157 | 5370-273-236 |
| 100 | 56C/48Y | 3600 | 18 | 90 | 5370-273-237 | 5370-273-237 |
| 180 | 182C/143TC 184C/145TC | 3600 | 18 | 90 | 5370-273-158 | 5370-273-238 |
| 210 | 213C/182TC 215C/184TC | 3600 | 57 | 90 | 5371-273-103 | |
| 215 | 213TC/215TC | 3600 | 57 | 90 | 5371-273-080 | |

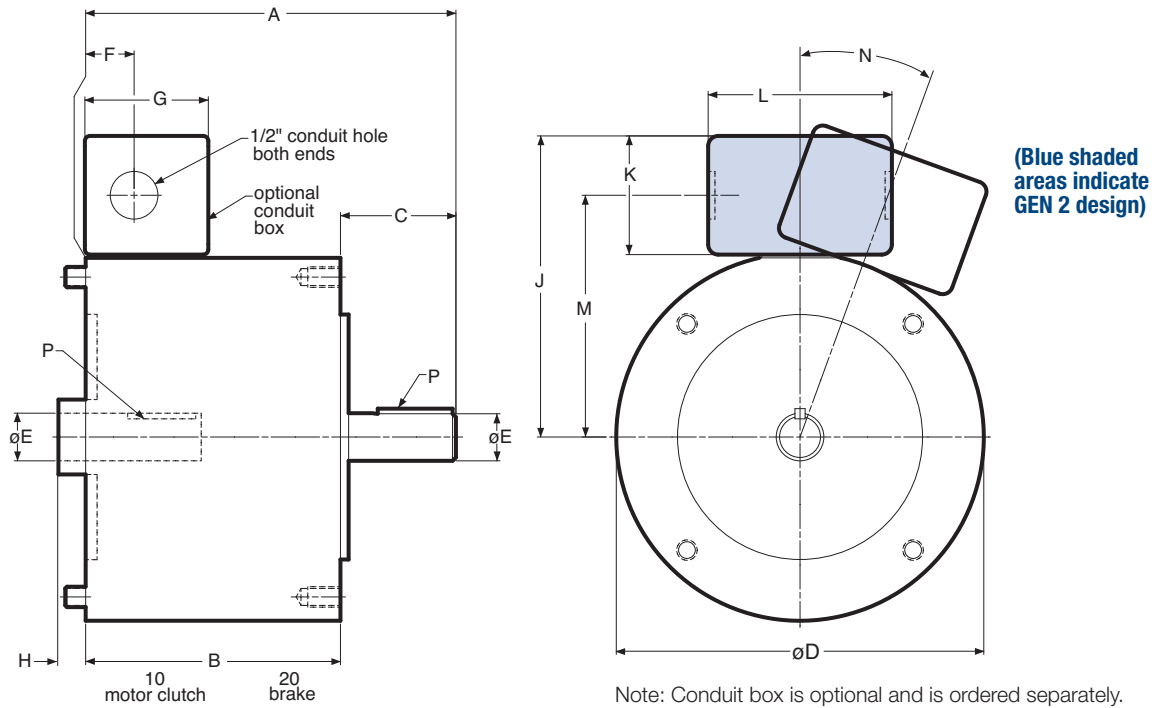
CBC-300 Dual Channel Torque Adjust Clutch/Brake Control

Conveyor applications occasionally require more clutch torque to start the line, and less brake torque to stop the line. With two independently adjustable channels, Warner Electric's CBC-300 allows you to set the torque levels for the clutch and brake independently of each other, so each can be tailored to every application to achieve optimum system performance.

| | |
|-----------------------|---|
| Part Number | 6021-448-001 |
| Input Power | 120 VAC +10% -15%, 50/60 Hz, single phase, 215 VA max. |
| Output | Pulse-width modulated full wave rectified D.C. Constant current, switch selectable ranges, 0-90 volt. |
| Current Adjust | Dual adjustable channels. Adjust via front panel potentiometers. |
| Other Features | UL listed; short circuit protection, line to line; torque limiting protects machine components from damage. |

UM Series Smooth-Start UniModules

UM-1020 Motor Clutch/Brake Combination



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|-------|-------|-------|-------|-------|------|-------|------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | — |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .890 | 2.267 | — |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | — |
| 210 | 8.891 | 5.922 | 2.500 | 9.250 | 1.125 | .500 | 2.267 | .500 |
| 215 | 9.391 | 5.922 | 3.000 | 9.250 | 1.375 | .500 | 2.267 | .500 |

| Size | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-----|-------------|
| 50 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 100 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 1/4 x 1/4 |
| 215 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 5/16 x 5/16 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 6, 24, 90 | 10 | 3600 | 56C/48Y* |
| 100 | 6, 24, 90 | 18 | 3600 | 56C/48Y* |
| 180 | 6, 24, 90 | 18 | 3600 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 57 | 3600 | 213C/182TC 215C/184TC |
| 215 | 6, 24, 90 | 57 | 3600 | 213TC/215TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

** UM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

UM-C Series UniModule – Ceramic Faced

High Performance with Extended Life

UniModules with ceramic friction material are pre-burnished during manufacturing to provide rated torque performance upon start up. They have been designed to mate easily with industry standard motors, reducers and other power transmission components.

- Bolt-it-down, wire-it-up... it's ready to go
- Available in 3 sizes; 50, 180 and 210 and 2 configurations; 1020 and 2030
- Standard voltages available 6V, 24V and 90V DC
- C-face or foot mounted
- No maintenance required
- Accurate positioning when used with CBC-700 OEX control

The Ceramic Difference . . .

Extended Life for High Cycle Rate Use

Ceramic faced clutches and brakes have been designed specifically for rapid cycling applications to satisfy today's needs for high speed equipment. Ceramic friction material provides excellent wear resistance that extends life 3 to 5 times that of standard clutch/brakes in demanding applications.

Consistent Torque and Cycle Repeatability

Preloaded armatures keep the ceramic friction surfaces lightly in contact to provide consistent torque and cycle-to-cycle repeatability. Variation is reduced by up to 30% over standard units. Autogap™ is not required.

Controllability – Smooth Start/Stop

With the ceramic friction surfaces always in contact, dynamic torque response is fast and precise. When used with a CBC-700 over-excitation control and CBC-1000 programmable counter, exceptional closed loop clutch/brake performance can be achieved approaching that of more expensive motion control technologies–The PerformancePlus difference!

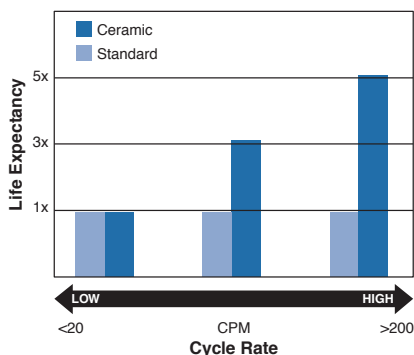


GEN 2 Design
Sizes 50 & 180

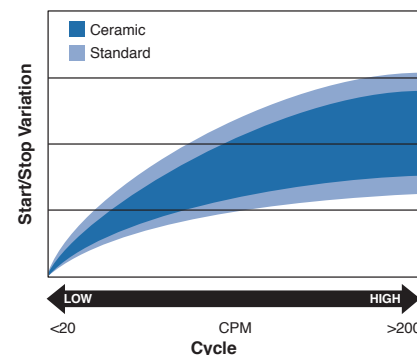
Original Design
Size 210



UM-C Product Life



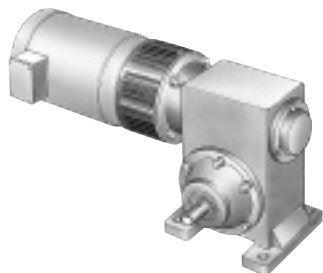
UM-C Cycle Repeat



Ceramic UniModule clutch/brake units may be mounted directly to NEMA C-face motors and reducers, or can be base mounted.

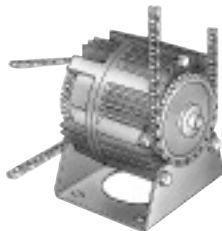
1. Determine Mounting Configuration

a. NEMA C-face Mounting (1020 Configuration)



To select the correct Ceramic UniModule package, determine the NEMA frame size of your motor and/or reducer, and choose the corresponding size UniModule from the Frame Size Selection chart.

b. Base Mount (2030 Configuration)



Ceramic UniModule assemblies may be mounted as separate drive units driven from the prime mover by V-belts, chain and sprockets, couplings, timing belts and other standard power transmission components.

Select the correct size module from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size UniModule is shown at the intersection of the HP and operating speed. For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Frame Size Selection

| NEMA Frame Size | UniModule Size |
|--------------------------|----------------|
| 56C/48Y | UM-50-C |
| 182C/143TC 184C/145TC | UM-180-C |
| 213C/182TC 215C/184TC | UM-210-C |

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |

UM-C Series UniModule – Ceramic Faced

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

N = Speed in revolutions per minute (RPM)

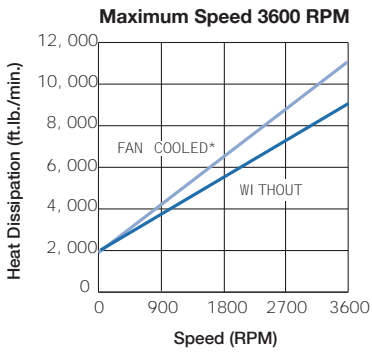
F = Cycle rate in cycles per minute (CPM)

Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

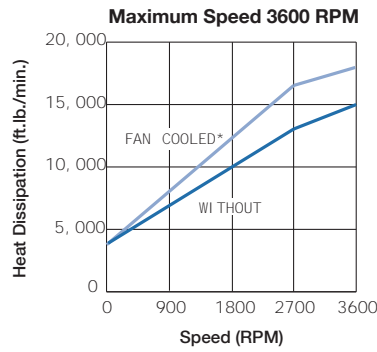
Note: At low cycle rates, the ceramic designs provide no additional wear life than standard designs.

Heat Dissipation Curves

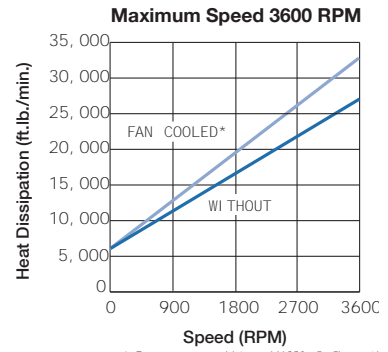
UM-50-C



UM-180-C



UM-210-C



* Fan accessory kit available for all configurations

b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart.

Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the Specifications Table to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

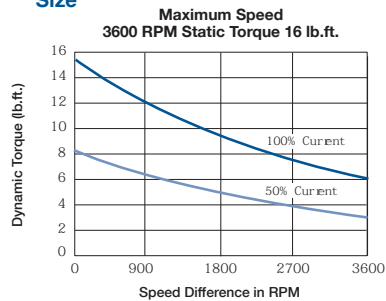
WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute (RPM)

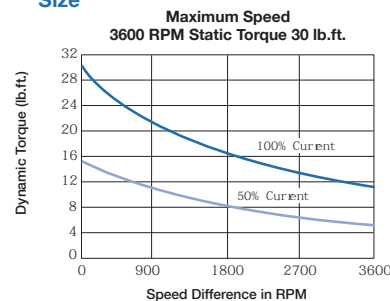
t = Time allowed for the engagement (sec)

C-face Clutch/Power-on Brake Dynamic Torque Curves

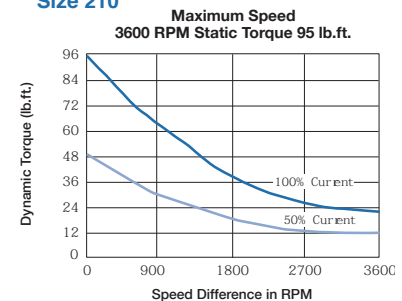
Size



Size



Size 210



UM-C Series UniModule – Ceramic Faced

Selection/Ordering Information

Specifications (Blue shaded areas indicate GEN 2 design)

| UniModule Size | Shaft Dia. | Static Torque lb. ft. | Horsepower | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|------------|-----------------------|------------|----------|--------------|--------------------------|
| UM50-C | 5/8" | 16 | 1/4-3/4 | 3600 | 6, 24 and 90 | 56C/48Y |
| UM180-C | 7/8" | 30 | 1-2 | 3600 | 6, 24 and 90 | 182C/143TC 184C/145TC |
| UM210-C | 1-1/8" | 95 | 3-5 | 3600 | 6, 24 and 90 | 213/182TC 215C/184TC |

3. Select Accessories

Warner Electric UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

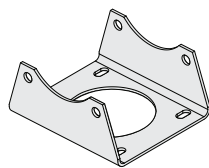
a. Conduit Box

NEMA 4 and UL listed.

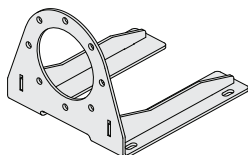


b. Mounting Brackets

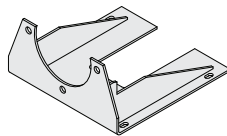
Two styles of mounting brackets are available for simplified installation. The base mount is used with the 2030 configuration. A motor mount is also available and provides sturdy support for the 1020 and a motor.



Base Mount



Motor Mount
For 50 & 180 sizes



Motor Mount
For 210 size

c. Fan Kit (1020 only)

Extends the thermal capacity of any size UM. Mounts between motor and UM, includes shaft fan, guard and hardware.



4. Select Control

Warner Electric manufactures clutch/brake controls to meet several system functions including:

- On/Off
- Torque adjust
- Overexcitation
- Position loop

Many requirements beyond function can impact control selection. See the Controls Section on page 201 for complete information.

UM-C Series UniModule – Ceramic Faced

Selection/Ordering Information

Part Numbers

| Model No. | Voltage | GEN 2 Part No. | Original Part No. |
|----------------------------------|---------|----------------|-------------------|
| 1020 (Motor Clutch/Brake) | | | |
| UM 50-1020-C | 6 | 5370-273-271 | 5370-273-077 |
| | 24 | 5370-273-273 | 5370-273-078 |
| | 90 | 5370-273-274 | 5370-273-079 |
| UM 180-1020-C | 6 | 5370-273-276 | 5370-273-073 |
| | 24 | 5370-273-278 | 5370-273-074 |
| | 90 | 5370-273-279 | 5370-273-075 |
| UM 210-1020-C | 6 | | 5371-273-035 |
| | 24 | | 5371-273-036 |
| | 90 | | 5371-273-037 |
| 2030 (Input Clutch/Brake) | | | |
| UM 50-2030-C | 6 | 5370-273-281 | 5370-273-085 |
| | 24 | 5370-273-283 | 5370-273-086 |
| | 90 | 5370-273-284 | 5370-273-087 |
| UM 180-2030-C | 6 | 5370-273-286 | 5370-273-081 |
| | 24 | 5370-273-288 | 5370-273-082 |
| | 90 | 5370-273-289 | 5370-273-083 |
| UM 210-2030-C | 6 | | 5371-273-039 |
| | 24 | | 5371-273-040 |
| | 90 | | 5371-273-041 |

Accessories

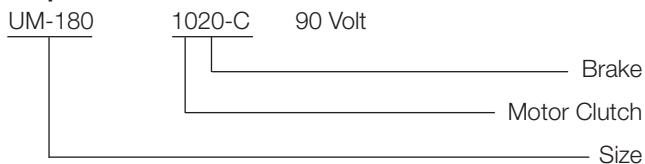
| Description | UM-C Size | Part Number |
|--------------------------------|-----------|--------------|
| Conduit Box | All sizes | 5370-101-042 |
| Fan Kits 1020 | 50 | 5370-101-055 |
| | 180 | 5370-101-054 |
| | 210 | 5371-101-029 |
| Base Mount Kits for 2030-C | 50 | 5370-101-004 |
| | 180 | 5370-101-002 |
| | 210 | 5371-101-001 |
| Motor Mount Kits for 1020-C | 50 | 5370-101-078 |
| | 180 | 5370-101-079 |
| | 210 | 5371-101-012 |

How to Order

Motor or Reducer Mounted

Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

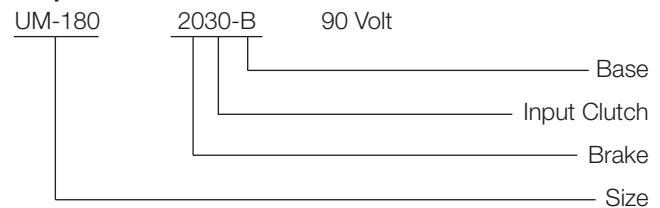
Example



Base Mounted

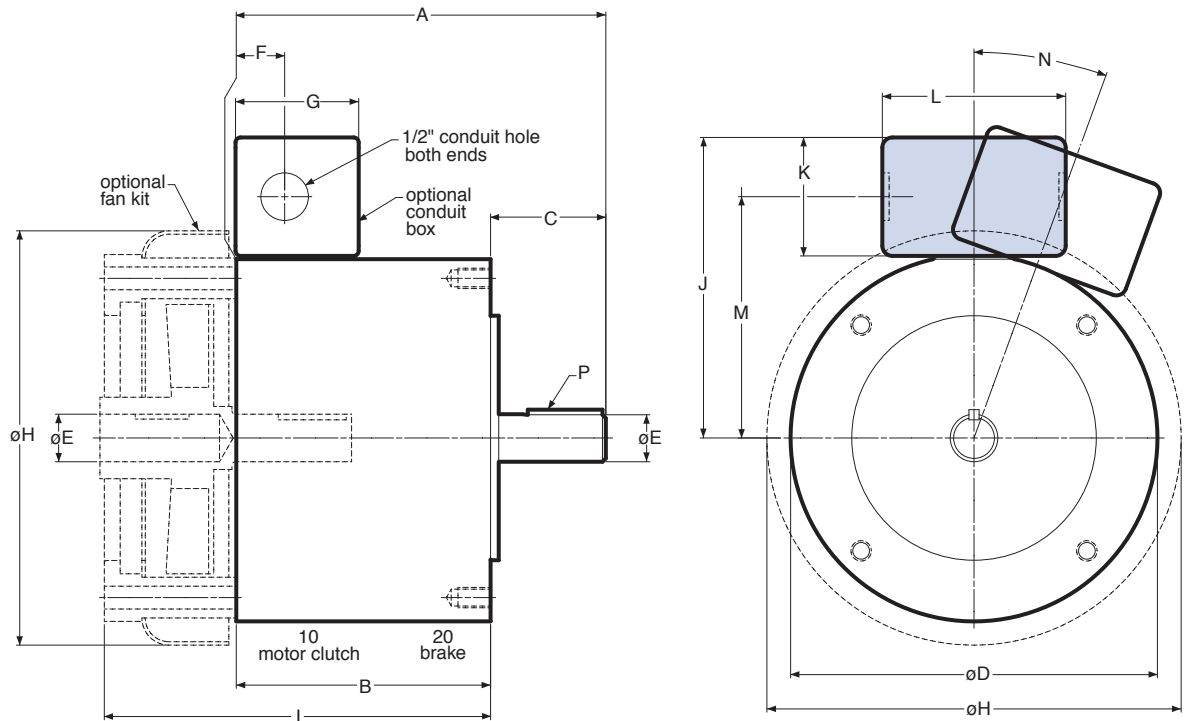
Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

Example



UM-C Series UniModule – Ceramic Faced

UM-1020-C Motor Clutch/Brake Combination



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|--------|--------|-------|-------|-------|------|-------|--------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | 7.620 |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | 7.620 |
| 210 | 9.391* | 6.422* | 2.500 | 9.250 | 1.125 | .500 | 2.267 | 10.187 |

| Size | I | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-------|-----|-------------|
| 50 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 9.297 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 1/4 x 1/4 |

*Dimension includes the .500 thick adapter. Required for C-face mounting to a motor.

Specifications (Blue shaded areas indicate GEN 2 design)

| UniModule Size | Static Torque lb. ft. | Horsepower | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|-----------------------|------------|----------|--------------|--------------------------|
| UM50-C | 16 | 1/4-3/4 | 3600 | 6, 24 and 90 | 56C/48Y |
| UM180-C | 30 | 1-2 | 3600 | 6, 24 and 90 | 182C/143TC 184C/145TC |
| UM210-C | 95 | 3-5 | 3600 | 6, 24 and 90 | 213/182TC 215C/184TC |

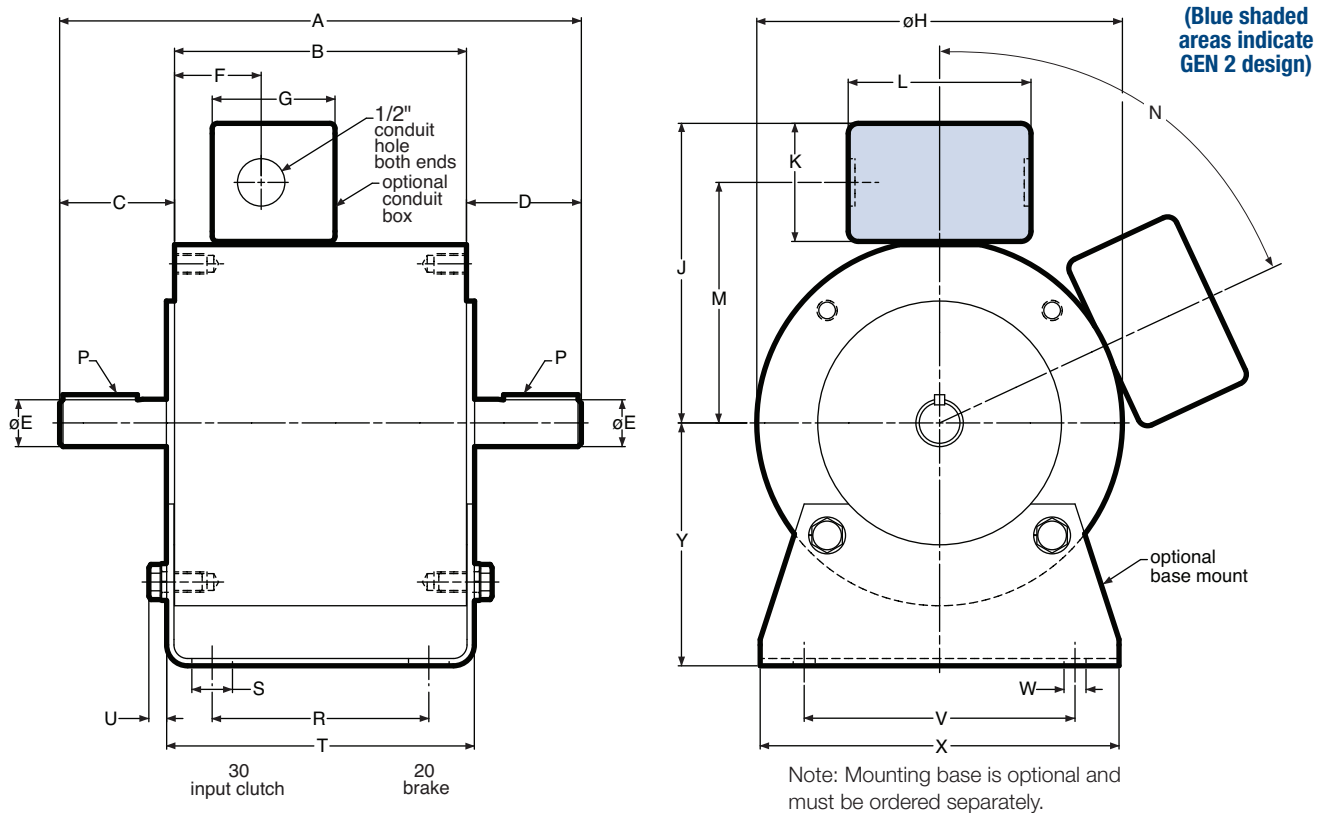
For standard NEMA frame dimensions, see page 187.

Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

UM-C Series UniModule – Ceramic Faced

UM-2030-C Brake/Input Clutch Combination

UM-2030-C-B Brake/Input Clutch Combination–Base Mounted



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L | M |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |

| Size | N | P | R | S | T | U | V | W | X | Y |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 65° | 1/4 x 1/4 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

For standard NEMA frame dimensions, see page 187.

Specifications (Blue shaded areas indicate GEN 2 design)

| UniModule Size | Static Torque lb. ft. | Horsepower | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|-----------------------|------------|----------|--------------|--------------------------|
| UM50-C | 16 | 1/4-3/4 | 3600 | 6, 24 and 90 | 56C/48Y |
| UM180-C | 30 | 1-2 | 3600 | 6, 24 and 90 | 182C/143TC 184C/145TC |
| UM210-C | 95 | 3-5 | 3600 | 6, 24 and 90 | 213/182TC 215C/184TC |

For standard NEMA frame dimensions, see page 187.

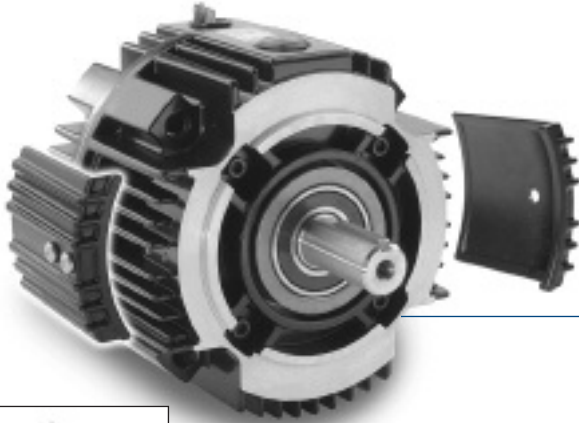
Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EUM Series Enclosed UniModule

EUM Series Clutch/Brakes and Clutch Combinations

Totally Enclosed Version

The Enclosed UniModule (EUM) packages the hardworking components from EM and UM products into a totally enclosed housing. This rugged housing keeps wear particles in and contaminants out and provides quiet operation. Pre-aligned at the factory, and pre-burnished for rated torque directly out-of-box.



For 50, 100 and 180 Sizes

Enclosed UniModules, (EUMs) for 50, 100, and 180 sizes, are being replaced by GEN 2 UniModules (UMs) and an easy to install cover kit.



GEN 2 Design

For 210 and 215 Sizes

Original EUM (black) units are totally enclosed. They are suitable for most industrial applications and tolerate infrequent, light washing. They have aluminum endbells and a finned housing for rapid heat dissipation.



Original Design

EUM Series Enclosed UniModule

50, 100, and 180 sizes

Contamination-Resistant Design

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.

Totally Enclosed Version

The Enclosed UniModule (EUM) packages the hardworking components from UM products into a totally enclosed housing. This rugged housing keeps wear particles in and contaminants out and provides quiet operation. Pre-burnished at the factory for rated torque directly out-of-box. When enclosed, they are suitable for most industrial applications and tolerate infrequent, light washing.

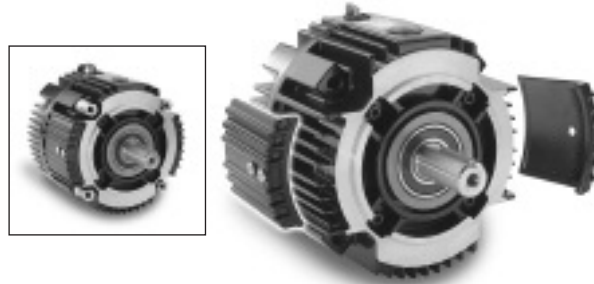
- Keeps contaminants out
- Keeps wear particles in
- Quiet operation
- Finned for heat dissipation
- UL listed when optional conduit box is installed

To convert any Gen 2 UniModule 50, 100, and 180 sizes to an EUM, purchase optional Cover Kit

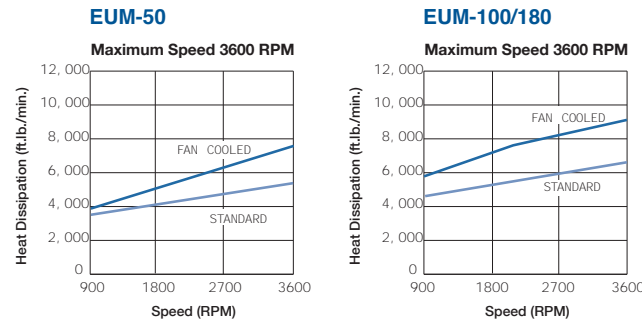
(part number 5370-101-076)

Enclosed UniModule Conversion

Enclosed UniModules, (EUMs) for 50, 100, and 180 sizes, are being replaced by GEN 2 UniModules (UMs) and an easy to install cover kit. Each kit contains (2) vent covers, (2) gaskets and (4) screws. A vent cover bolts to both sides of the UniModule unit to enclose the open vents of the housing creating a totally enclosed (non-washdown) brake package which keeps contaminants out and wear particles in for clean, quiet operation.



GEN 2 Heat Dissipation Curves



Note: For ORIGINAL DESIGN EUM 50,100 and 180 curves, see page 62.

How To Order

GEN 2 EUM models can be ordered in the following two ways:

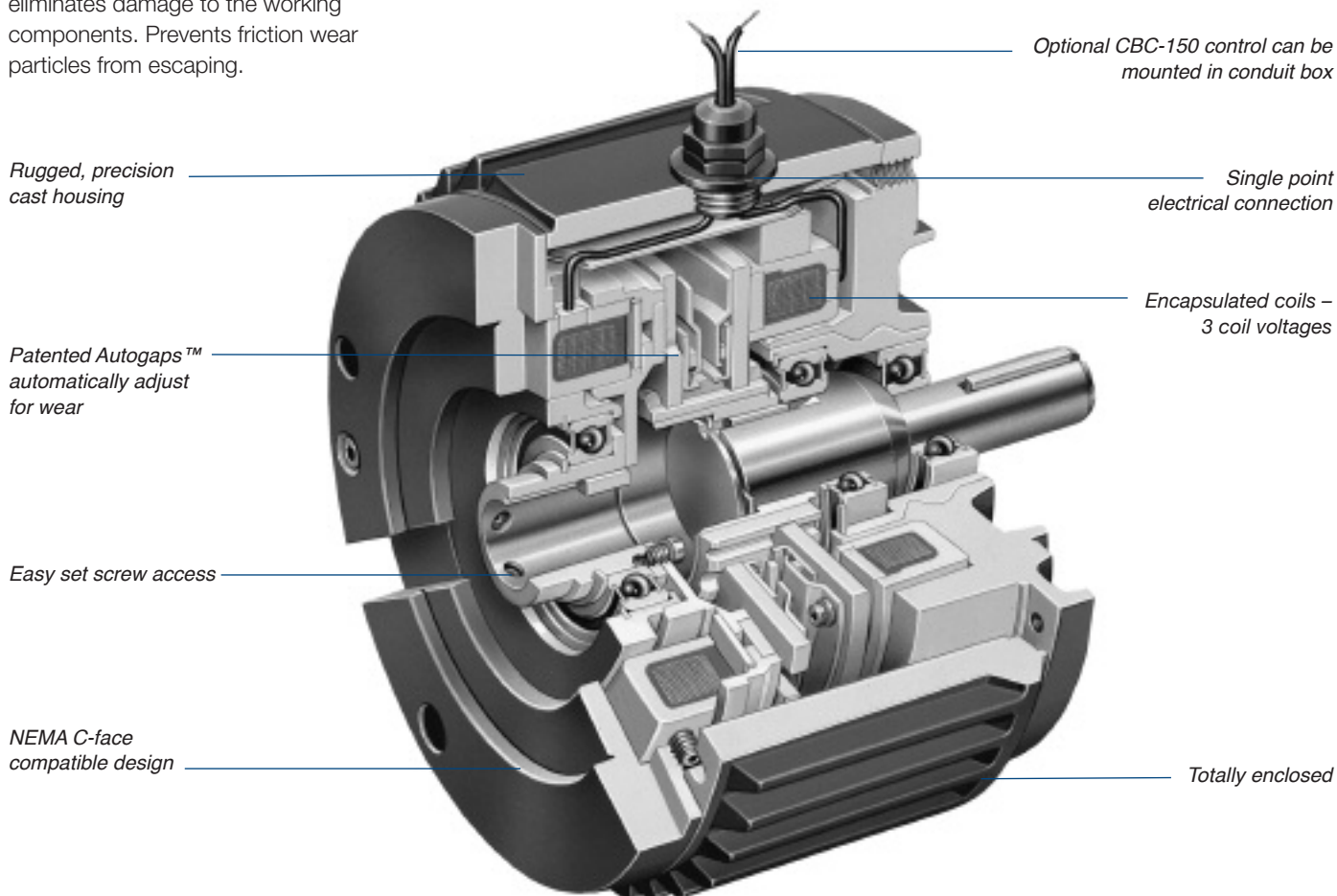
1. Combined part number, UniModule including cover kit (ex. 5370-15)
2. Separate part numbers, UniModule and cover kit (ex. 5370-273-201 and 5370-101-076)

| Totally Enclosed EUM Model No. | Voltage D.C. | Original Design Part No. | COMBINED GEN 2 Part No. OR UniModule w/kit | | SEPARATE GEN 2 Part Numbers UniModule and Cover Kit | |
|--------------------------------|--------------|--------------------------|--|--|---|------------------|
| | | | | | | |
| 1020 Configuration | | | | | | |
| EUM-50-1020 | 6 | 5370-273-058 | 5370-15 | | 5370-273-201 | and 5370-101-076 |
| | 24 | 5370-273-059 | 5370-16 | | 5370-273-203 | and 5370-101-076 |
| | 90 | 5370-273-057 | 5370-17 | | 5370-273-204 | and 5370-101-076 |
| EUM-100-1020 | 6 | 5370-273-092 | 5370-18 | | 5370-273-206 | and 5370-101-076 |
| | 24 | 5370-273-093 | 5370-19 | | 5370-273-208 | and 5370-101-076 |
| | 90 | 5370-273-091 | 5370-20 | | 5370-273-209 | and 5370-101-076 |
| EUM-180-1020 | 6 | 5370-273-066 | 5370-21 | | 5370-273-211 | and 5370-101-076 |
| | 24 | 5370-273-067 | 5370-22 | | 5370-273-213 | and 5370-101-076 |
| | 90 | 5370-273-065 | 5370-23 | | 5370-273-214 | and 5370-101-076 |
| 1040 Configuration | | | | | | |
| EUM-50-1040 | 90 | 5370-271-050 | 5370-24 | | 5370-271-204 | and 5370-101-076 |
| EUM-180-1040 | 90 | 5370-271-051 | 5370-25 | | 5370-271-214 | and 5370-101-076 |
| 2030 Configuration | | | | | | |
| EUM-50-2030 | 6 | 5370-273-062 | 5370-26 | | 5370-273-216 | and 5370-101-076 |
| | 24 | 5370-273-063 | 5370-27 | | 5370-273-218 | and 5370-101-076 |
| | 90 | 5370-273-061 | 5370-28 | | 5370-273-219 | and 5370-101-076 |
| EUM-180-2030 | 6 | 5370-273-070 | 5370-29 | | 5370-273-226 | and 5370-101-076 |
| | 24 | 5370-273-071 | 5370-30 | | 5370-273-228 | and 5370-101-076 |
| | 90 | 5370-273-069 | 5370-31 | | 5370-273-229 | and 5370-101-076 |

EUM Series Enclosed UniModule

210 and 215 sizes

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.



One piece, C-face package completely assembled and factory aligned. Mates easily with standard motors and reducers. Foot mounted package also available. Easy-to-install and no maintenance required.

Bolt-it-down, wire-it-up. UniModule is ready to go. Automatic adjustment for wear. Complete control capability.

Available with built-in power supply or used with separate controls for soft starts and stops . . . or for fast acting, accurate cycling.

- Factory burnished for out-of-box torque
- Superior heat transfer
- Dual endbell for easy repair
- Single point electrical connection
- Optional conduit box
- Optional integral control

Improved Hub Design/Autogap System

- Improved for longer spline life
- Autogap functions over broad current range
- New hub material

EUM Totally Enclosed

EUM (black) units are totally enclosed to keep wear particles in and exclude contaminants and are suitable for most industrial applications.

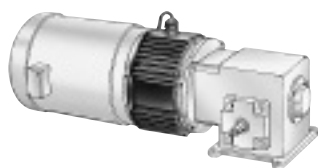
EUM Series Enclosed UniModule

Selection

EUM - Selection Procedure

Warner Electric EUM clutch/brake modules normally mount in either of two methods: NEMA C-face mounting or base mounting.

1. Select Configuration



a. NEMA C-face Mounting (1020 and 1040 Configurations)

Based on the NEMA C-face frame size of the prime mover, select the corresponding clutch/brake package size from the Frame Size Selection chart. Size 100 houses the components of the size 180 in a size 50 frame, while size 215 incorporates size 210 components.

Select either a 1020 or a 1040 (EUM only) configuration. The 1020 is a clutch/brake, while the 1040 is a clutch only. The 2030 configuration is a clutch/brake for base mounting.

Frame Size Selection

| NEMA Frame Size | EUM Size |
|--------------------------|----------------------|
| 56C/48Y | EUM-50* EUM-100** |
| 182C/143TC 184C/145TC | EUM-180 |
| 213C/182TC 215C/184TC | EUM-210 |
| 213TC/215TC | EUM-215 |

* For 56C/48Y Frame motors 3/4 HP and smaller the EUM-100 size may be used where extended life is desirable.
** EUM-100 size is recommended for motors 1 HP and larger.

b. Base Mounting (2030 Configuration)



Enclosed UniModule assemblies may be mounted as separate drive units driven from the prime mover by V-belts, chain and sprockets, couplings, timing belts and other standard power transmission components.

Select the correct size 2030 package from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size EUM is shown at the intersection of the HP and operating speed. For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Two heat dissipation curves are shown. A fan kit accessory is available for use with these units.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

N = Speed in revolutions per minute (RPM)

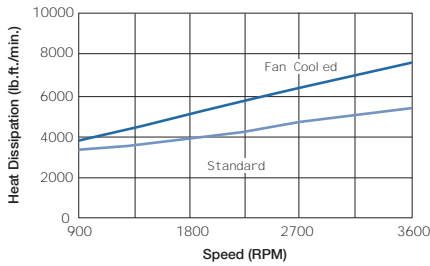
F = Cycle rate in cycles per minute (CPM)

Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Enclosed UniModule Heat Dissipation Curves

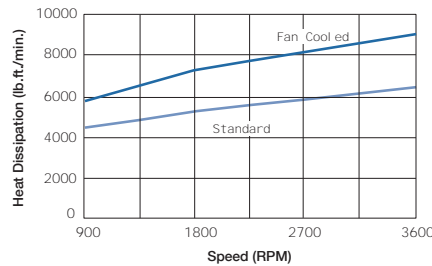
EUM-50

Maximum Speed 3600 RPM



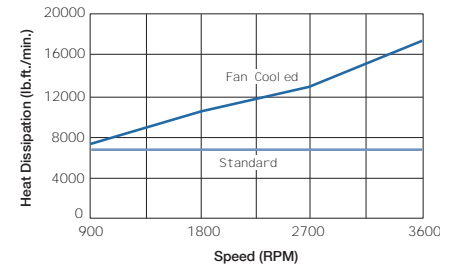
EUM-100/180

Maximum Speed 3600 RPM



EUM 210/215 (Fan not available on 215)

Maximum Speed 3600 RPM



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart.

Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the Specifications Table to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

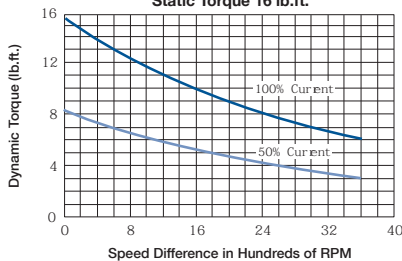
N = Speed in revolutions per minute (RPM)

t = Time allowed for the engagement (sec)

C-face Clutch/Power-on Brake Dynamic Torque Curves

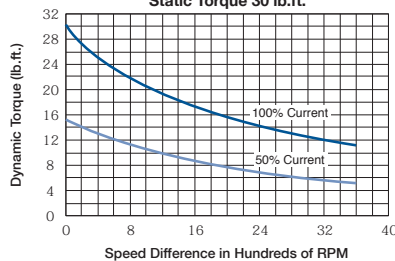
EUM 50

Maximum Speed 3600 RPM
Static Torque 16 lb.ft.



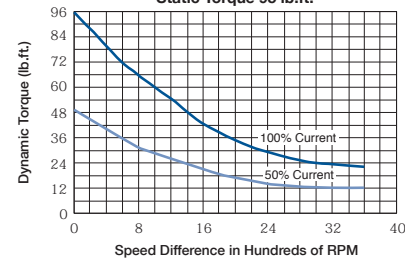
EUM 100/180

Maximum Speed 3600 RPM
Static Torque 30 lb.ft.



EUM 210/215

Maximum Speed 3600 RPM
Static Torque 95 lb.ft.



EUM Series Enclosed UniModule

Specifications

| UniModule Size | Shaft Dia. | Static Torque lb. ft. | Horsepower | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|------------|-----------------------|------------|----------|--------------|--------------------------|
| EUM50 | .625 | 16 | 1/4-3/4 | 3600 | 6, 24 and 90 | 56C/48Y |
| EUM100 | .625 | 30 | 1-2 | 3600 | 6, 24 and 90 | 56C/48Y |
| EUM180 | .875 | 30 | 1-2 | 3600 | 6, 24 and 90 | 182C/143TC 184C/145TC |
| EUM210 | 1.125 | 95 | 3-5 | 3600 | 6, 24 and 90 | 213/182TC 215C/184TC |
| EUM215 | 1.375 | 95 | 7-1/2-10 | 3600 | 6, 24 and 90 | 213TC/215TC |

Accessories

Warner Electric Enclosed UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

Conduit Box

NEMA 4 and UL listed, available in standard and washdown versions.



Integral Control

The CBC-150 dual channel control fits into the cover of the conduit box. It is suitable for AC side switching (triac or relay) and includes high performance suppression.



Fan Kit (UM and EUM 1020 only)

Extends the thermal capacity of an EUM. Mounts between motor and EUM, includes shaft, fan, guard and hardware. Available in standard black coating or food grade approved white coating.

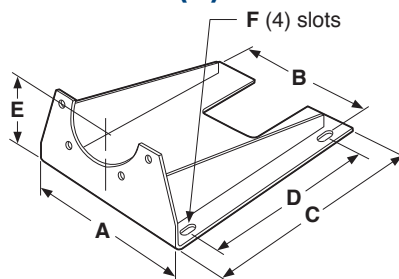


Mounting Brackets

Two styles of mounting brackets are available for simplified installation. The base mount is used with the 2030 configuration. A motor mount is also available and provides sturdy support for a 1020 or 1040 combination with motor.

(Optional)

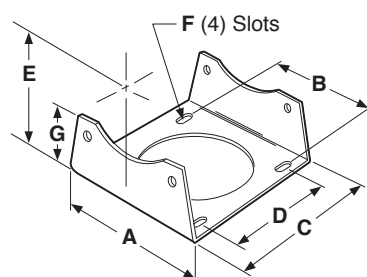
Motor Mount (M)



For use with 1020 and 1040 Combinations.

| Size | A | B | C | D | E | F | Part No. |
|---------|-------|-------|-------|-------|------|-------------|--------------|
| 50/100 | 9.25 | 8.25 | 11.00 | 8.000 | 3.50 | .797 x .406 | 5370-101-078 |
| 180 | 9.25 | 8.25 | 11.00 | 8.000 | 4.50 | .797 x .406 | 5370-101-079 |
| 210/215 | 11.50 | 10.50 | 12.00 | 9.000 | 5.25 | .750 x .406 | 5371-101-012 |

Base (B)



For use with 2030 and 3040 units.

| Size | A | B | C | D | E | F | G | Part No. |
|---------|-------|-------|-------|-------|-------|-------------|-------|--------------|
| 50/100 | 6.000 | 5.000 | 5.672 | 4.000 | 3.500 | .750 x .406 | 2.000 | 5370-101-004 |
| 180 | 6.625 | 5.000 | 5.672 | 4.000 | 4.500 | .750 x .406 | 3.000 | 5370-101-002 |
| 210/215 | 9.000 | 7.750 | 8.203 | 6.000 | 5.250 | .750 x .531 | 3.385 | 5371-101-001 |

EUM Series Enclosed UniModule

Selection and Ordering Information

Part Numbers

| Totally Enclosed EUM Model No. | Voltage D.C. | Original Design Part No. | COMBINED GEN 2 Part No. UniModule w/kit | OR | SEPARATE GEN 2 Part Numbers | | |
|--|--------------|--------------------------|---|----|-----------------------------|-----|--------------|
| | | | | | UniModule | and | Cover Kit |
| 1020 Configuration – Enclosed EUM | | | | | | | |
| EUM-50-1020 | 6 | 5370-273-058 | 5370-15 | | 5370-273-201 | and | 5370-101-076 |
| | 24 | 5370-273-059 | 5370-16 | | 5370-273-203 | and | 5370-101-076 |
| | 90 | 5370-273-057 | 5370-17 | | 5370-273-204 | and | 5370-101-076 |
| EUM-100-1020 | 6 | 5370-273-092 | 5370-18 | | 5370-273-206 | and | 5370-101-076 |
| | 24 | 5370-273-093 | 5370-19 | | 5370-273-208 | and | 5370-101-076 |
| | 90 | 5370-273-091 | 5370-20 | | 5370-273-209 | and | 5370-101-076 |
| EUM-180-1020 | 6 | 5370-273-066 | 5370-21 | | 5370-273-211 | and | 5370-101-076 |
| | 24 | 5370-273-067 | 5370-22 | | 5370-273-213 | and | 5370-101-076 |
| | 90 | 5370-273-065 | 5370-23 | | 5370-273-214 | and | 5370-101-076 |
| EUM-210-1020 | 6 | 5371-273-028 | | | | | |
| | 24 | 5371-273-029 | | | | | |
| | 90 | 5371-273-027 | | | | | |
| EUM-215-1020 | 6 | 5371-273-082 | | | | | |
| | 24 | 5371-273-083 | | | | | |
| | 90 | 5371-273-084 | | | | | |
| 1040 Configuration – Enclosed EUM | | | | | | | |
| EUM-50-1040 | 90 | 5370-271-050 | 5370-24 | | 5370-271-204 | and | 5370-101-076 |
| EUM-180-1040 | 90 | 5370-271-051 | 5370-25 | | 5370-271-214 | and | 5370-101-076 |
| EUM-210-1040 | 90 | 5371-271-024 | | | | | |
| 2030 Configuration – Enclosed EUM | | | | | | | |
| EUM-50-2030 | 6 | 5370-273-062 | 5370-26 | | 5370-273-216 | and | 5370-101-076 |
| | 24 | 5370-273-063 | 5370-27 | | 5370-273-218 | and | 5370-101-076 |
| | 90 | 5370-273-061 | 5370-28 | | 5370-273-219 | and | 5370-101-076 |
| EUM-180-2030 | 6 | 5370-273-070 | 5370-29 | | 5370-273-226 | and | 5370-101-076 |
| | 24 | 5370-273-071 | 5370-30 | | 5370-273-228 | and | 5370-101-076 |
| | 90 | 5370-273-069 | 5370-31 | | 5370-273-229 | and | 5370-101-076 |
| EUM-210-2030 | 6 | 5371-273-032 | | | | | |
| | 24 | 5371-273-033 | | | | | |
| | 90 | 5371-273-031 | | | | | |

Accessories

| Option | Size | Enclosed UniModule |
|--|-------------|--------------------|
| Conduit box | All sizes | 5370-101-042 |
| Control | CBC-150-1 | 6004-448-001 |
| | CBC-150-2 | 6004-448-002 |
| Base Mount Kits for 2030 | 50 | 5370-101-004 |
| | 50/180* | 5370-101-002 |
| | 210 | 5371-101-001 |
| Motor Mount Kits for 1020, 1040 | 50/100 | 5370-101-078 |
| | 50/100/180* | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| Fan Kits for 1020 | 50/100 | 5370-101-055 |
| | 180 | 5370-101-054 |
| | 210 | 5371-101-029 |
| | | |

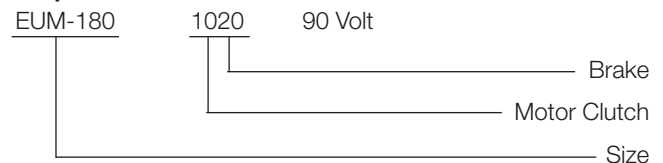
* Because of diameter limitations, bases for original design EUMs are available in 4.5" center height (143/145TC) only.

How to Order

Motor or Reducer Mounted

Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

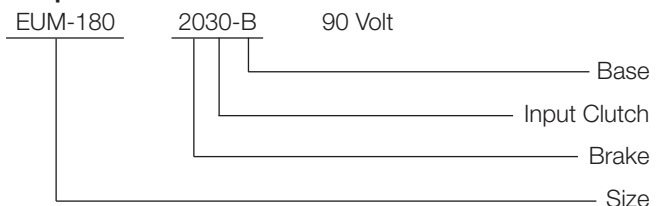
Example



Base Mounted

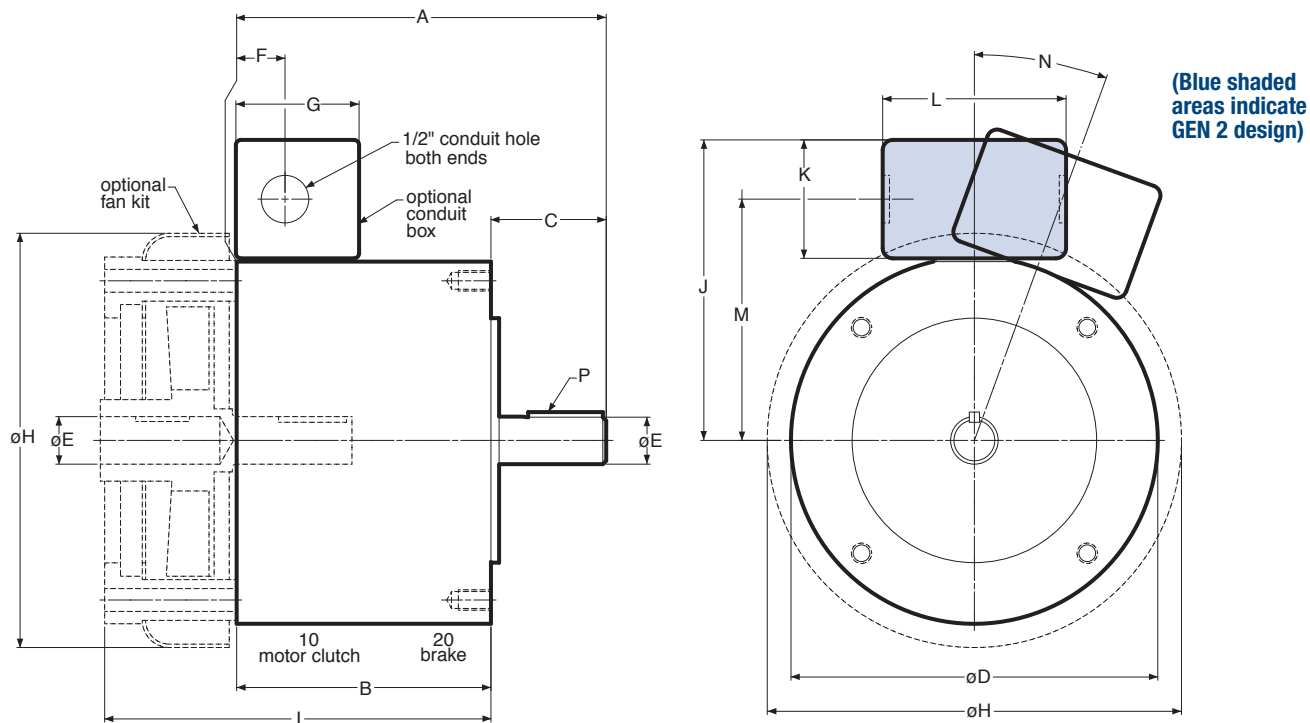
Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

Example



EUM Series Enclosed UniModule

EUM-1020 Motor Clutch/Brake Combination



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|--------|--------|-------|--------|-------|-------|-------|--------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | 7.620 |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .890 | 2.267 | 7.620 |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | 7.620 |
| 210 | 9.391* | 6.422* | 2.500 | 10.000 | 1.125 | 3.053 | 2.267 | 10.187 |
| 215 | 9.391* | 6.422* | 2.500 | 10.000 | 1.375 | 3.053 | 2.267 | 10.187 |

| Size | I | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-------|-----|-------------|
| 50 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 100 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 9.297 | 7.146 | 2.180 | 3.250 | 6.056 | 35° | 1/4 x 1/4 |
| 215 | 9.297 | 7.146 | 2.180 | 3.250 | 6.056 | 35° | 5/16 x 5/16 |

* Dimension includes the .500 thick adapter required for mounting to a C-face motor.

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | 56C/48Y* |
| 100 | 6, 24, 90 | 30 | 3600 | 56C/48Y** |
| 180 | 6, 24, 90 | 30 | 3600 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | 213C/182TC 215C/184TC |
| 215 | 6, 24, 90 | 95 | 3600 | 213TC/215TC |

* For 56C/48Y Frame motors 3/4 HP and smaller the UM-100 size may be used where extended life is desirable.

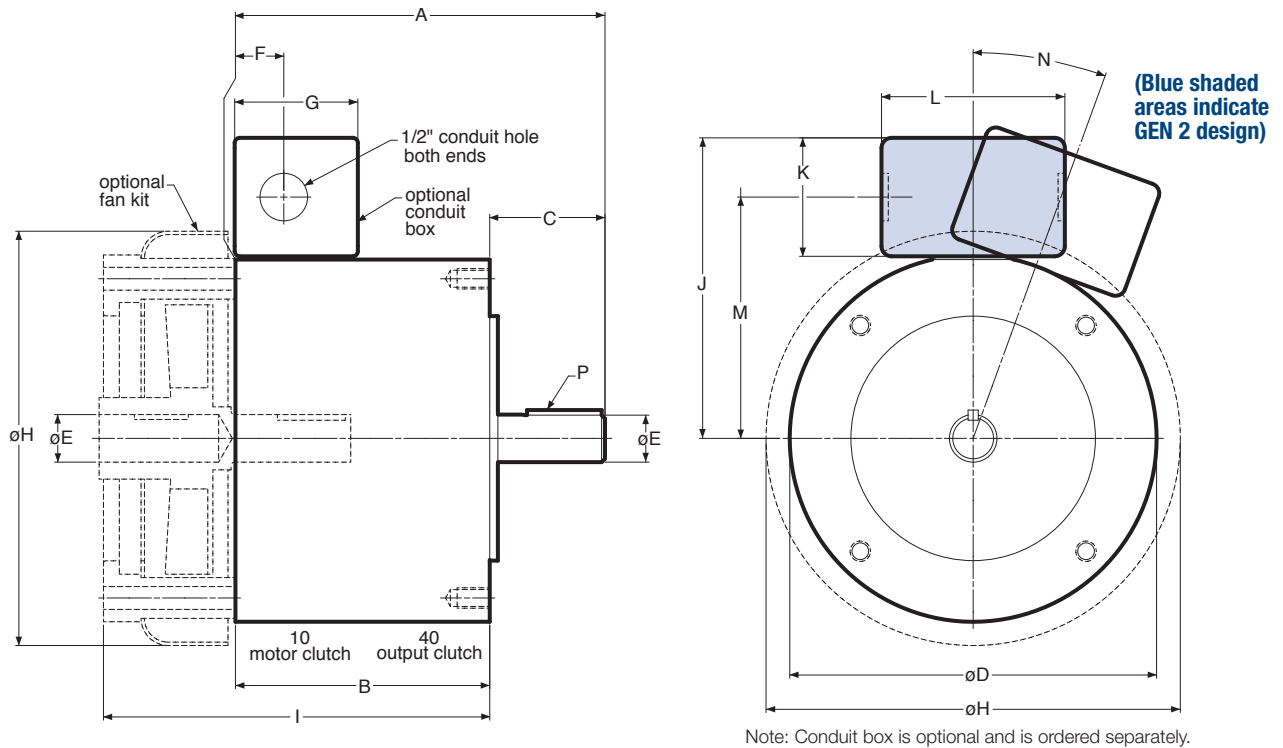
** UM-100 size is recommended for motors 1 HP and larger.

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

EUM Series Enclosed UniModule

EUM-1040 Motor Clutch/Output Clutch Combination



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|--------|--------|-------|--------|-------|-------|-------|--------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | 7.620 |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | 7.620 |
| 210 | 9.391* | 6.422* | 2.500 | 10.000 | 1.125 | 3.053 | 2.267 | 10.187 |

| Size | I | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-------|-----|-------------|
| 50 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 7.110 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 9.297 | 7.146 | 2.180 | 3.250 | 6.056 | 35° | 1/4 x 1/4 |

* Dimension includes the .500 thick adapter required for mounting to a C-face motor.

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 90 | 16 | 3600 | 56C/48Y |
| 180 | 90 | 30 | 3600 | 182C/143TC 184C/145TC |
| 210 | 90 | 95 | 3600 | 213C/182TC 215C/184TC |

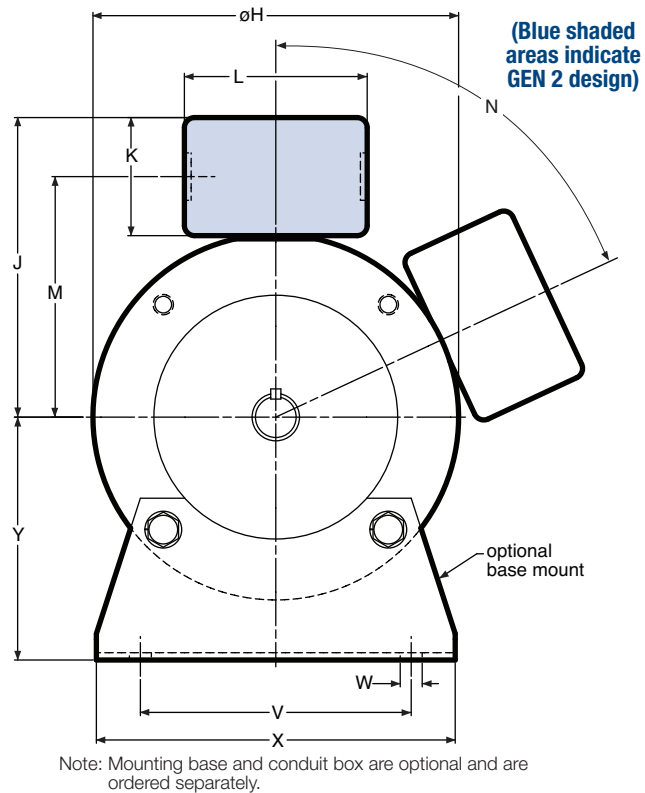
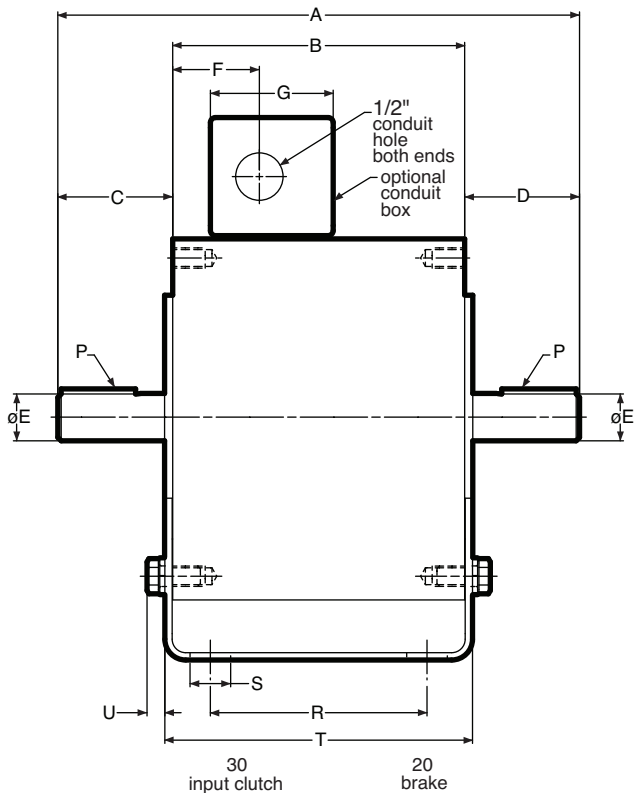
For standard NEMA frame dimensions, see page 187.

Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EUM Series Enclosed UniModule

EUM-2030 Input Clutch/Brake Combination

EUM-2030-B Input Clutch/Brake Combination – Base Mounted



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L | M |
|------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 210 | 12.969 | 7.719 | 2.500 | 2.500 | 1.125 | 4.514 | 2.267 | 10.000 | 7.146 | 2.180 | 3.250 | 6.056 |

| Size | N | P | R | S | T | U | V | W | X | Y |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 35° | 1/4 x 1/4 | 6.000 | .750 | 8.260 | .437 | 7.750 | .534 | 9.000 | 5.250 |

Specifications (Blue shaded areas indicate GEN 2 design)

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | NEMA Frame Size |
|------------|------------|-----------------------|----------|--------------------------|
| 50 | 6, 24, 90 | 16 | 3600 | 56C/48Y |
| 180 | 6, 24, 90 | 30 | 3600 | 182C/143TC 184C/145TC |
| 210 | 6, 24, 90 | 95 | 3600 | 213C/182TC 215C/184TC |

For standard NEMA frame dimensions, see page 187.

Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

EUM-W Series Enclosed UniModule

Contamination-Proof Design

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.

Rugged, precision cast housing

Patented Autogaps™ automatically adjust for wear

Easy set screw access

NEMA C-face compatible design



Optional CBC-150 control can be mounted in conduit box

Single point electrical connection

Encapsulated coils – 3 coil voltages

Totally enclosed

One piece, C-face package completely assembled and factory aligned. Mates easily with standard motors and reducers. Foot mounted package also available. Easy-to-install and no maintenance required.

Bolt-it-down, wire-it-up. UniModule is ready to go. Automatic adjustment for wear. Complete control capability.

Available with built-in power supply or used with separate controls for soft starts and stops . . . or for fast acting, accurate cycling.

- Factory burnished for out-of-box torque
- Superior heat transfer
- Dual endbell for easy repair
- Single point electrical connection
- Optional conduit box
- Optional integral control

Improved Hub Design/Autogap System

- Improved for longer spline life
- Autogap functions over broad current range
- New hub material

EUM-W Washdown Unit

EUM-W (white) units are ideal for applications that require frequent washing with high pressure spray systems.

EUM-W Series Enclosed UniModule

EUM-W Series Clutch/Brakes and Clutch Combinations

EUM-W Series Clutch/Brakes Washdown Unit

The washdown version of the EUM uses stainless steel shafting, USDA approved coating, corrosion resistant fasteners and special sealing accessories for use in washdown applications.

EUM-W (white) units are ideal for applications that require frequent washing with high pressure spray systems. Their smooth exterior does not allow food particles, or other contaminants, to get trapped and become host to bacteriological growth.

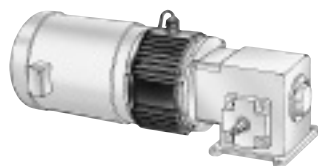
- USDA approved coating
- Stainless steel shafting
- Sealing (gaskets and plugs)
- Smooth exterior – easy washdown
- Corrosion resistant hardware
- Sealed/shielded bearings
- Baffled ventilation system
- Designed for IP65 enclosure requirements
- UL listed when conduit box is employed



EUM-W - Selection Procedure

Warner Electric EUM-W clutch/brake modules normally mount in either of two methods: NEMA C-face mounting or base mounting.

1. Select Configuration



a. NEMA C-face Mounting (1020 and 1040 Configurations)

Based on the NEMA C-face frame size of the prime mover, select the corresponding clutch/brake package size from the Frame Size Selection chart. Size 100 houses the components of the size 180 in a size 50 frame, while size 215 incorporates size 210 components.

Select either a 1020 or a 1040 (EUM-W only) configuration. The 1020 is a clutch/brake, while the 1040 is a clutch only. The 2030 configuration is a clutch/brake for base mounting.

Frame Size Selection

| NEMA Frame Size | EUM-W Size |
|-----------------|------------------------|
| 56C/48Y | EUM50-W* EUM100-W** |
| 182C/143TC | EUM180-W |
| 184C/145TC | |
| 213C/182TC | EUM210-W |
| 215C/184TC | |
| 213TC/215TC | EUM215-W |

* For 56C/48Y Frame motors 3/4 HP and smaller the EUM100-W size may be used where extended life is desirable.

** EUM100-W size is recommended for motors 1 HP and larger.

b. Base Mounting (2030 Configuration)



Washdown enclosed UniModule assemblies may be mounted as separate drive units driven from the prime mover by V-belts, chain and sprockets, couplings, timing belts and other standard power transmission components.

Select the correct size 2030 package from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size EUM-W is shown at the intersection of the HP and operating speed. For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Two heat dissipation curves are shown. A fan kit accessory is available for use with these units.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 |
| 1/4 | EUM50-W | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | |
| 3/4 | EUM100/180-W | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | |
| 1-1/2 | EUM210/215-W | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | |
| 3 | EUM210-W | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | |
| 7-1/2 | EUM215-W | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

EUM-W Series Enclosed UniModule

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

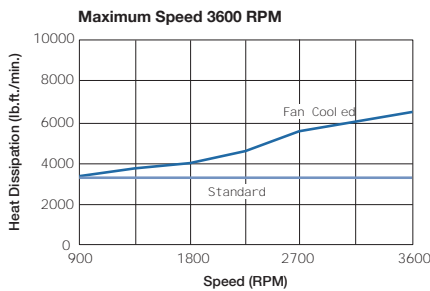
N = Speed in revolutions per minute (RPM)

F = Cycle rate in cycles per minute (CPM)

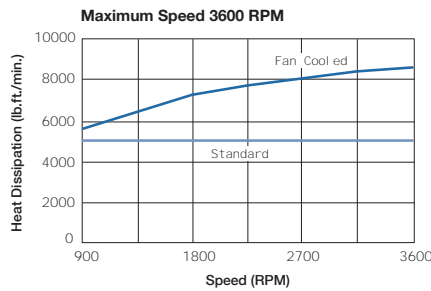
Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Washdown Enclosed UniModule Heat Dissipation Curves

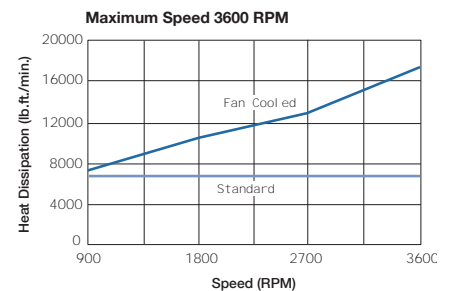
EUM50-W



EUM100/180-W



EUM210/215-W (fan not available at 215)



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart.

Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the Specifications Table to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

$$T = \text{Average Dynamic Torque (lb. ft.)}$$

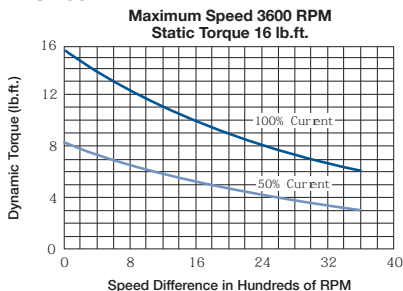
WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute (RPM)

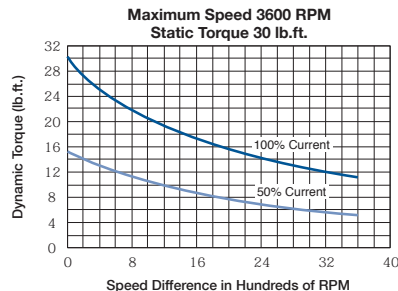
t = Time allowed for the engagement (sec)

C-face Clutch/Power-on Brake Dynamic Torque Curves

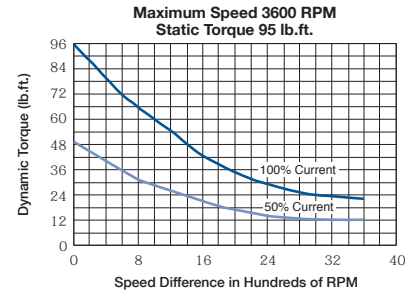
EUM50-W



EUM100/180-W



EUM210/215-W



EUM-W Series Enclosed UniModule

Specifications

| UniModule Size | Shaft Dia. | Static Torque lb. ft. | Horsepower | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|------------|-----------------------|------------|----------|--------------|--------------------------|
| EUM50-W | .625 | 16 | 1/4-3/4 | 3600 | 6, 24 and 90 | 56C/48Y |
| EUM100-W | .625 | 30 | 1-2 | 3600 | 6, 24 and 90 | 56C/48Y |
| EUM180-W | .875 | 30 | 1-2 | 3600 | 6, 24 and 90 | 182C/143TC 184C/145TC |
| EUM210-W | 1.125 | 95 | 3-5 | 3600 | 6, 24 and 90 | 213/182TC 215C/184TC |
| EUM215-W | 1.375 | 95 | 7-1/2-10 | 3600 | 6, 24 and 90 | 213TC/215TC |

3. Select Options

Accessories

Warner Electric Enclosed Washdown UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

Conduit Box

NEMA 4 and UL listed, available in standard and washdown versions.



Integral Control

The CBC-150 dual channel control fits into the cover of the conduit box. It is suitable for AC side switching (triac or relay) and includes high performance suppression.



Fan Kit (UM and EUM 1020 only)

Extends the thermal capacity of an EUM-W. Mounts between motor and EUM-W, includes shaft, fan, guard and hardware. Available in standard black coating or food grade approved white coating.

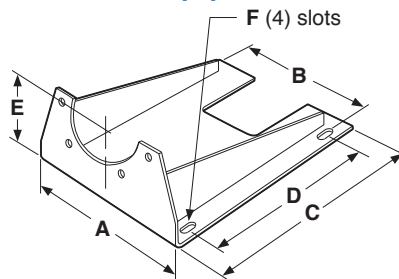


Mounting Brackets

Two styles of mounting brackets are available for simplified installation. The base mount is used with the 2030 configuration. A motor mount is also available and provides sturdy support for a 1020 or 1040 combination with motor.

(Optional)

Motor Mount (M)

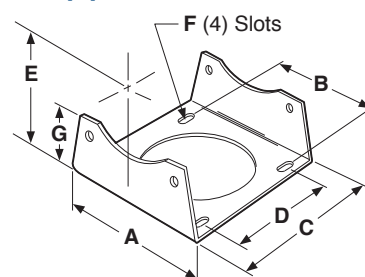


For use with 1020 and 1040 Combinations.

| Size | A | B | C | D | E | F | Part No. |
|-------------|-------|-------|-------|-------|------|-------------|--------------|
| 50/100/180* | 9.25 | 8.25 | 10.50 | 8.000 | 4.50 | .800 x .406 | 5370-101-080 |
| 210/215 | 11.50 | 10.50 | 12.00 | 9.000 | 5.25 | .750 x .406 | 5371-101-026 |

* Because of diameter limitations, EUM-W bases are available in 4.5" center height (143/145TC) only.

Base (B)



For use with 2030 and 3040 units.

| Size | A | B | C | D | E | F | G | Part No. |
|---------|-------|-------|-------|-------|-------|-------------|-------|--------------|
| 50/180* | 6.625 | 5.680 | 5.672 | 4.000 | 4.500 | .750 x .406 | 3.000 | 5370-101-047 |
| 210 | 9.000 | 7.750 | 8.260 | 6.000 | 5.250 | .750 x .531 | 3.375 | 5371-101-025 |

* Because of diameter limitations, EUM-W bases are available in 4.5" center height (143/145TC) only.

EUM-W Series Enclosed UniModule

Selection and Ordering Information

Part Numbers

| Model No. | Voltage | Original Part No. |
|--|---------|-------------------|
| 1020 Configuration – Washdown EUM-W | | |
| EUM-50-1020W | 6 | 5370-273-100 |
| | 24 | 5370-273-101 |
| | 90 | 5370-273-099 |
| EUM-100-1020W | 6 | 5370-273-108 |
| | 24 | 5370-273-109 |
| | 90 | 5370-273-107 |
| EUM-180-1020W | 6 | 5370-273-116 |
| | 24 | 5370-273-117 |
| | 90 | 5370-273-115 |
| EUM-210-1020W | 6 | 5371-273-056 |
| | 24 | 5371-273-057 |
| | 90 | 5371-273-055 |
| EUM-215-1020W | 6 | 5371-273-086 |
| | 24 | 5371-273-087 |
| | 90 | 5371-273-088 |
| 2030 Configuration – Washdown EUM-W | | |
| EUM-50-2030W | 6 | 5370-273-104 |
| | 24 | 5370-273-105 |
| | 90 | 5370-273-103 |
| EUM-180-2030W | 6 | 5370-273-120 |
| | 24 | 5370-273-121 |
| | 90 | 5370-273-119 |
| EUM-210-2030W | 6 | 5371-273-060 |
| | 24 | 5371-273-061 |
| | 90 | 5371-273-059 |

Accessories

| Option | Size | Washdown UniModule |
|---|-------------|--------------------|
| Conduit box | All sizes | 5370-101-045 |
| Control | CBC-150-1 | 6004-448-001 |
| | CBC-150-2 | 6004-448-002 |
| Base Mount Kits for 2030 | 50/180* | 5370-101-047 |
| | 210 | 5371-101-025 |
| Motor Mount Kits for 1020, 1040 | 50/100/180* | 5370-101-080 |
| | 210/215 | 5371-101-026 |
| Fan Kits for 1020 | 50/100 | 5370-101-060 |
| | 180 | 5370-101-061 |
| | 210 | 5371-101-033 |

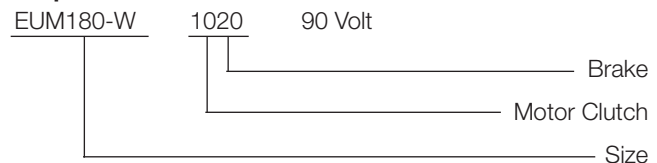
* Because of diameter limitations, EUM bases are available in 4.5" center height (143/145TC) only.

How to Order

Motor or Reducer Mounted

Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

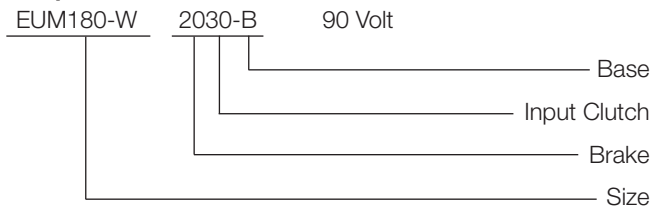
Example



Base Mounted

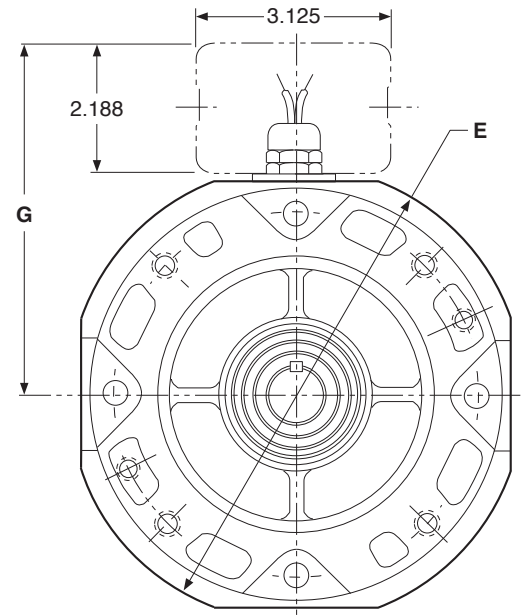
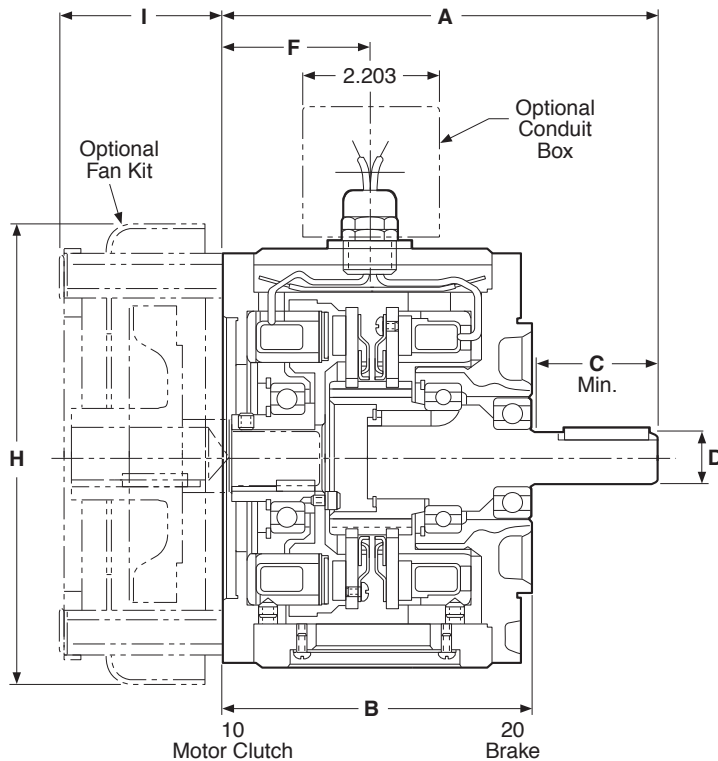
Simply combine the size number with the configuration of the required UniModule. Specify voltage. See chart for specific part numbers. Order optional conduit box if desired.

Example



EUM-W Series Enclosed UniModule

EUM-W-1020 Clutch/Brake Combination



Note: Washdown UniModules (EUM-W) do not have a finned housing.

Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A | B | C | D | E | F | G | H | I |
|--------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| 50/100 | 6.750 | 4.844 | 1.813 | .625 | 6.915 | 2.427 | 5.936 | 7.687 | 2.430 |
| 180 | 6.828 | 4.844 | 1.890 | .875 | 6.915 | 2.427 | 5.936 | 7.687 | 2.430 |
| 210 | 8.891 | 5.922 | 2.500 | 1.125 | 10.00 | 3.053 | 7.146 | 10.187 | 3.375 |
| 215 | 9.391 | 5.922 | 3.000 | 1.375 | 10.00 | 3.053 | 7.146 | 10.187 | 3.375 |

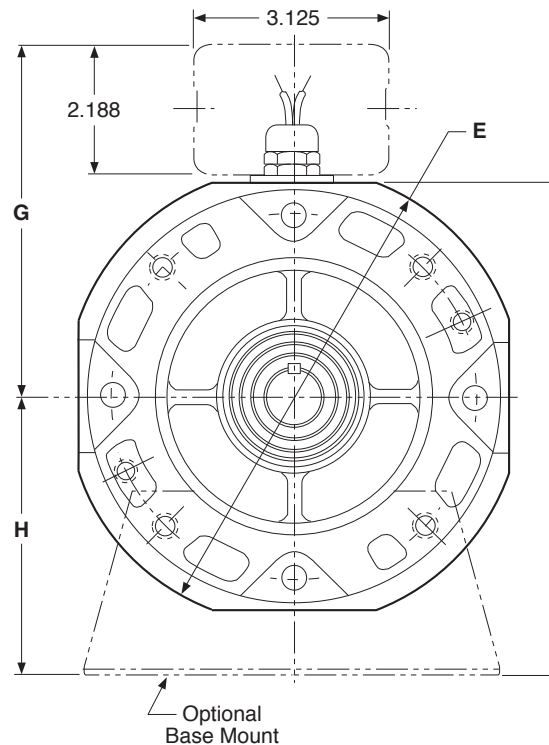
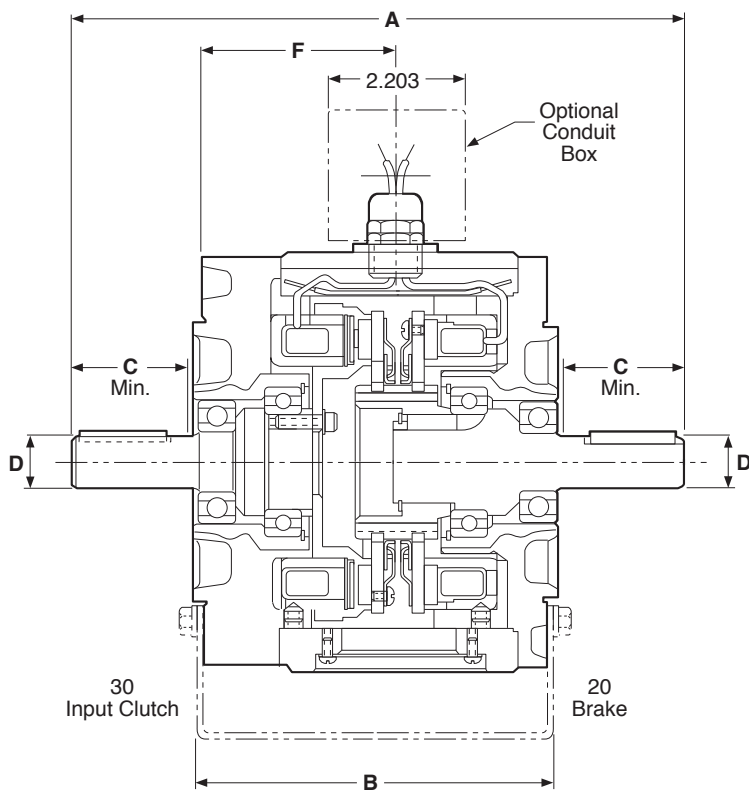
Specifications

| UniModule Size | Shaft Dia. | Horsepower | Static Torque lb. ft. | CPM @1750 RPM | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|------------|------------|-----------------------|---------------|----------|-------------|--------------------------|
| EUM50-W | .625 | 1/4-3/4 | 16 | 125 | 3600 | 6, 24 or 90 | 56C/48Y |
| EUM100-W | .625 | 1 | 30 | 90 | 3600 | 6, 24 or 90 | 56C/48Y |
| EUM180-W | .875 | 1-2 | 30 | 90 | 3600 | 6, 24 or 90 | 182C/143TC 184C/145TC |
| EUM210-W | 1.125 | 3-5 | 95 | 37 | 3600 | 6, 24 or 90 | 213/182TC 215C/184TC |
| EUM215-W | 1.375 | 7-1/2 | 95 | 37 | 3600 | 6, 24 or 90 | 213TC/215TC |

For NEMA standard frame dimensions, see page 187.

EUM-W Series Enclosed UniModule

EUM-W-2030 Clutch/Brake Combination–Base Mounted



Note: Washdown UniModules (EUM-W) do not have a finned housing.

All dimensions are nominal, unless otherwise noted.

Dimensions

| Size | A | B | C | D | E | F | G | H | I |
|------|--------|-------|-------|-------|-------|-------|-------|-------|--------|
| 50 | 9.516 | 5.672 | 1.813 | .625 | 6.915 | 3.164 | 5.936 | 3.670 | 7.119 |
| 180 | 9.516 | 5.672 | 1.890 | .875 | 6.915 | 3.164 | 5.936 | 4.484 | 8.119 |
| 210 | 12.969 | 8.260 | 2.500 | 1.125 | 10.00 | 4.514 | 7.146 | 5.234 | 10.234 |

Specifications

| UniModule Size | Shaft Dia. | Horsepower | Static Torque lb. ft. | CPM @1750 RPM | Max. RPM | Voltage DC | NEMA Frame Size |
|----------------|------------|------------|-----------------------|---------------|----------|-------------|--------------------------|
| EUM50-W | 5/8" | 1/4-3/4 | 16 | 125 | 3600 | 6, 24 or 90 | 56C/48Y |
| EUM100-W | 5/8" | 1 | 30 | 175 | 3600 | 6, 24 or 90 | 56C/48Y |
| EUM180-W | 7/8" | 1-2 | 30 | 175 | 3600 | 6, 24 or 90 | 182C/143TC 184C/145TC |
| EUM210-W | 1-1/8" | 3-5 | 95 | 32 | 3600 | 6, 24 or 90 | 213/182TC 215C/184TC |

For NEMA standard frame dimensions, see page 187.

Shaft Mounted Clutches and Brakes

Shaft Mounted Clutches

EC Series

All the features of an electric clutch in a convenient, preassembled package. Mounts on any through shaft or double shafted motor. Easy-to-assemble with standard sheaves, pulleys, gears and sprockets.

Available in a wide range of bore sizes. Shaft extension makes pulley or sprocket installation easy.

Shaft Mounted Brakes

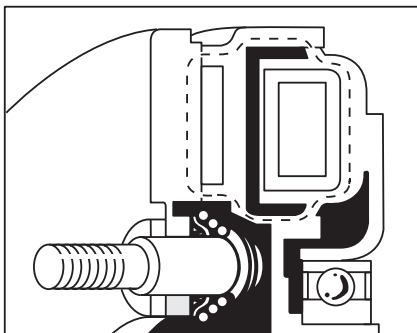
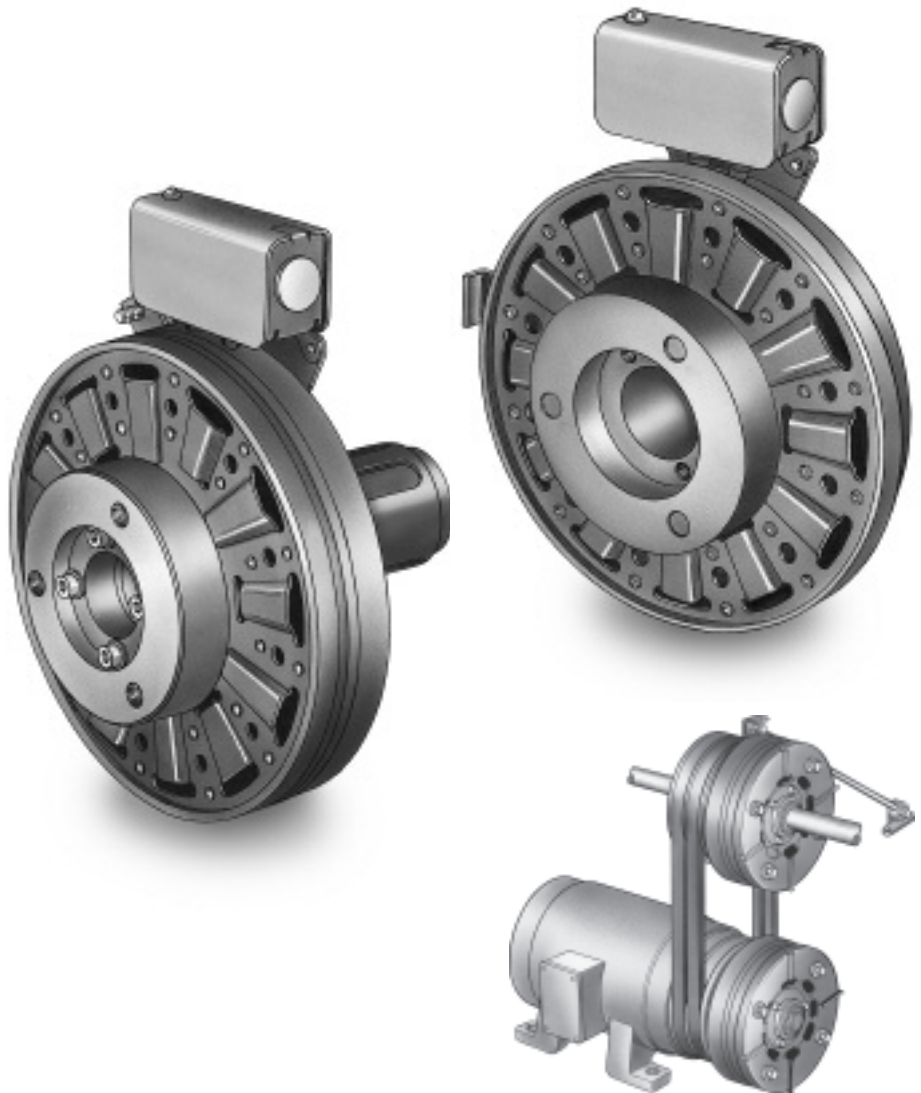
EB Series

Electro Brakes mount directly on a motor or through shaft for basic braking functions.

Torque arm feature makes Electro Brakes easy to install on any through shaft or double shaft motor.

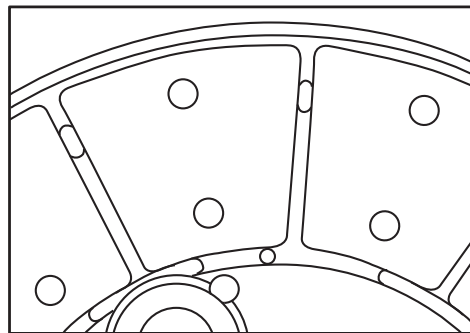
Segmented and fluted armature disc provides maximum cooling of friction surfaces.

- Six sizes of clutches and brakes
- 16 lb. ft. to 465 lb. ft. torque range
- Preassembled. Factory aligned.
- Mounting flexibility
- Simple to install



Brushless Design

Warner Electric designed electromagnetic circuit eliminates brushes.



Heat Dissipation

Specially designed segmented armature disc is segmented and fluted to provide maximum cooling of friction surfaces. Automatically adjusts for wear.

Motor mounted Electro Clutch used in combination with an Electro Brake on a through shaft installation.

EC Series Electro Clutch

Shaft Mounted Clutches

Mounting flexibility

Standard Electro Clutches are offered in a wide variety of bore sizes.

No brushes to wear out

Warner Electric designed electro-magnetic circuit eliminates brushes.

UL listed

Conduit box meets industry standards.

Simple installation

Easy-to-install a pulley, sprocket, sheave or gear on the Electro Clutch shaft extension.

Long life – no maintenance

Specially designed armature disc is segmented and fluted to provide maximum cooling of friction surfaces. Automatically adjusts to wear.

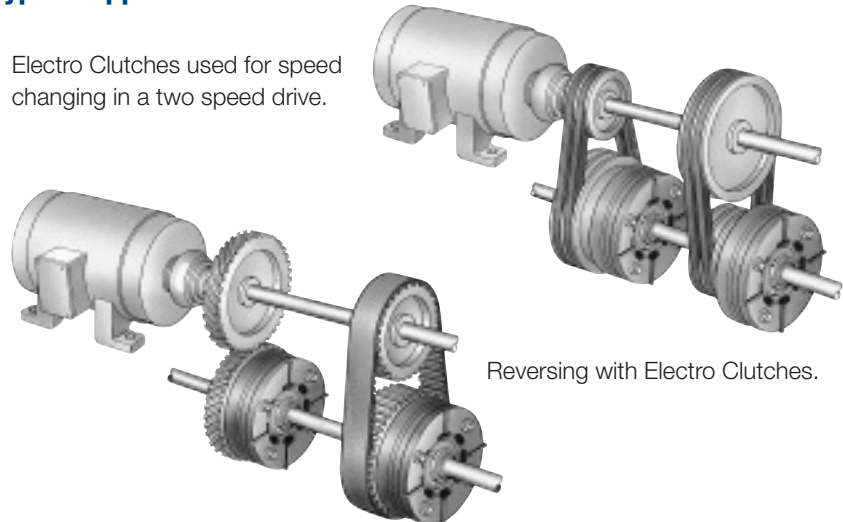
Packaged Performance

The engineering is built-in. Warner Electric Packaged Performance products are factory aligned and pre-assembled. They have been designed to mate easily with industry standard motors, reducers and other power transmission components. "Bolt-it-down and wire-it-up". . . they're ready to go.

- Hubs mate to standard sheaves, sprockets, gears and pulleys
- Wide torque range from 16 to 465 lb. ft.
- Handle 1 to 20 HP at 1800 RPM

Typical Applications

Electro Clutches used for speed changing in a two speed drive.



Reversing with Electro Clutches.

EC Series Electro Clutch

Selection/Ordering Information

Selection Procedure

1. Determine the motor horsepower and r.p.m. at the clutch location.
2. Use the Horsepower vs. Shaft Speed chart to determine the right size Electro Clutch.
3. When ordering, specify bore size and voltage.
4. To get maximum performance from your Electro Clutch, use a Warner Electric Control. See the Controls Section.

Note:
Electro Clutches require extended length motor shafts for motor mounting.

Part Numbers

| Model Size | Bore Size | Voltage DC | Part No. |
|------------|-----------|------------|--------------|
| EC-375 | 1/2" | 6 | 5180-271-006 |
| | | 24 | 5180-271-004 |
| | | 90 | 5180-271-009 |
| EC-475 | 5/8" | 6 | 5180-271-002 |
| | | 24 | 5180-271-008 |
| | | 90 | 5180-271-005 |
| EC-475 | 3/4" | 6 | 5181-271-033 |
| | | 24 | 5181-271-037 |
| | | 90 | 5181-271-036 |
| EC-475 | 7/8" | 6 | 5181-271-032 |
| | | 24 | 5181-271-038 |
| | | 90 | 5181-271-034 |
| EC-650 | 1" | 6 | 5181-271-031 |
| | | 24 | 5181-271-039 |
| | | 90 | 5181-271-035 |
| EC-650 | 1-1/8" | 6 | 5281-271-004 |
| | | 24 | 5281-271-018 |
| | | 90 | 5281-271-007 |
| EC-650 | 1-1/4" | 6 | 5281-271-002 |
| | | 24 | 5281-271-019 |
| | | 90 | 5281-271-005 |
| EC-825 | 1-3/8" | 6 | 5281-271-009 |
| | | 24 | 5281-271-020 |
| | | 90 | 5281-271-008 |
| EC-825 | 1-1/8" | 6 | 5281-271-003 |
| | | 24 | 5281-271-016 |
| | | 90 | 5281-271-006 |
| EC-825 | 1-1/4" | 6 | 5282-271-002 |
| | | 24 | 5282-271-008 |
| | | 90 | 5282-271-011 |
| EC-825 | 1-3/8" | 6 | 5282-271-003 |
| | | 24 | 5282-271-009 |
| | | 90 | 5282-271-012 |
| EC-1000 | 1-3/8" | 6 | 5282-271-004 |
| | | 24 | 5282-271-010 |
| | | 90 | 5282-271-013 |
| EC-1000 | 1-1/2" | 6 | 5283-271-002 |
| | | 24 | 5283-271-010 |
| | | 90 | 5283-271-003 |
| EC-1000 | 1-5/8" | 6 | 5283-271-012 |
| | | 24 | 5283-271-011 |
| | | 90 | 5283-271-005 |
| EC-1225 | 1-5/8" | 6 | 5284-271-008 |
| | | 24 | 5284-271-013 |
| | | 90 | 5284-271-010 |
| EC-1225 | 1-7/8" | 6 | 5284-271-002 |
| | | 24 | 5284-271-014 |
| | | 90 | 5284-271-003 |
| EC-1225 | 2-1/8" | 6 | 5284-271-004 |
| | | 24 | 5284-271-015 |
| | | 90 | 5284-271-005 |

Note: Metric bores available in some sizes, consult factory.

Horsepower vs. Shaft Speed

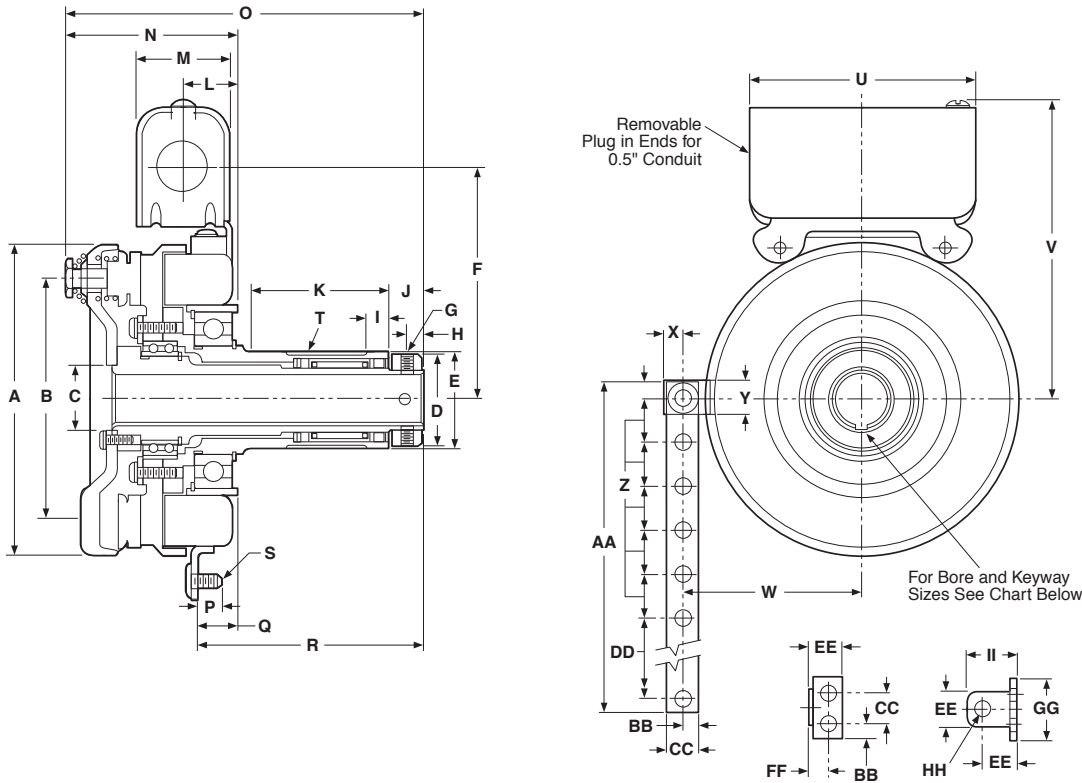
| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 | 5000 | |
| 1/50 | | | | | | | | | | | | | | | | | | | | | | |
| 1/20 | | | | | | | | | | | | | | | | | | | | | | |
| 1/12 | | | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | |

Specifications

| Electro Clutch Size | Static Torque lb. ft. | Max. RPM | Voltage DC | Total Wt. lbs. |
|---------------------|-----------------------|----------|-------------|----------------|
| EC-375 | 16 | 5000 | 6, 24 or 90 | 4 |
| EC-475 | 30 | 4500 | 6, 24 or 90 | 8 |
| EC-650 | 95 | 3600 | 6, 24 or 90 | 18 |
| EC-825 | 125 | 3600 | 6, 24 or 90 | 28 |
| EC-1000 | 240 | 2000 | 6, 24 or 90 | 41 |
| EC-1225 | 465 | 2000 | 6, 24 or 90 | 85 |

EC Series Electro Clutch

EC-375, EC-475, EC-650



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Dia. | C Min. | D Dia. | E Dia. | F | G | H | I | J | K Max. | L | M |
|------|--------|--------|--------|--------|--------|-------|------------|------|------|------|--------|------|-------|
| 375 | 4.078 | 3.125 | .7505 | 1.313 | 1.375 | 3.344 | 10-24 UNC | .188 | .375 | .344 | 2.047 | .781 | 1.547 |
| | | | | | 1.374 | | -3A x 5/15 | | | | | | |
| 475 | 5.172 | 4.000 | 1.0625 | 1.563 | 1.625 | 3.922 | 1/4-20 UNC | .281 | .375 | .578 | 2.359 | .875 | 1.547 |
| | | | | | 1.624 | | -3A x 7/16 | | | | | | |
| 650 | 6.578 | 5.125 | 1.625 | 2.375 | 2.5000 | 4.625 | 1/4-20 UNC | .281 | .188 | .563 | 3.047 | .953 | 1.547 |
| | | | | | 2.4985 | | -3A x 1/2 | | | | | | |

Bore Sizes and Keyways

| Size | Bore Dia. | Keyway |
|------|-----------|--------------|
| 375 | .625 | *3/16 x 1/16 |
| | .500 | 1/8 x 1/16 |
| 475 | .750 | 3/16 x 3/32 |
| | .875 | *3/16 x 1/16 |
| 650 | .625 | 3/16 x 3/32 |
| | 1.125 | *1/4 x 1/8 |
| | 1.375 | *5/16 x 3/32 |
| | 1.000 | 1/4 x 1/8 |
| | 1.250 | 1/4 x 1/8 |

*Key Furnished

| Size | N Max. | O Max. | P | Q Max. | R Min. | S | T | U | V Max. | W | X |
|------|--------|--------|------|--------|--------|---------------|-------------|-------|--------|-------|------|
| 375 | 2.484 | 4.984 | .438 | .609 | 3.000 | 1/4-20 UNC-2A | 5/16 x 3/32 | 3.750 | 4.438 | 2.438 | .313 |
| 475 | 3.219 | 6.266 | .422 | .658 | 3.641 | 1/4-20 UNC-2A | 3/8 x 3/32 | 3.750 | 4.984 | 2.984 | .313 |
| 650 | 3.547 | 7.141 | .422 | .722 | 4.359 | 1/4-20 UNC-2A | 5/8 x 3/32 | 3.750 | 5.750 | 3.750 | .313 |

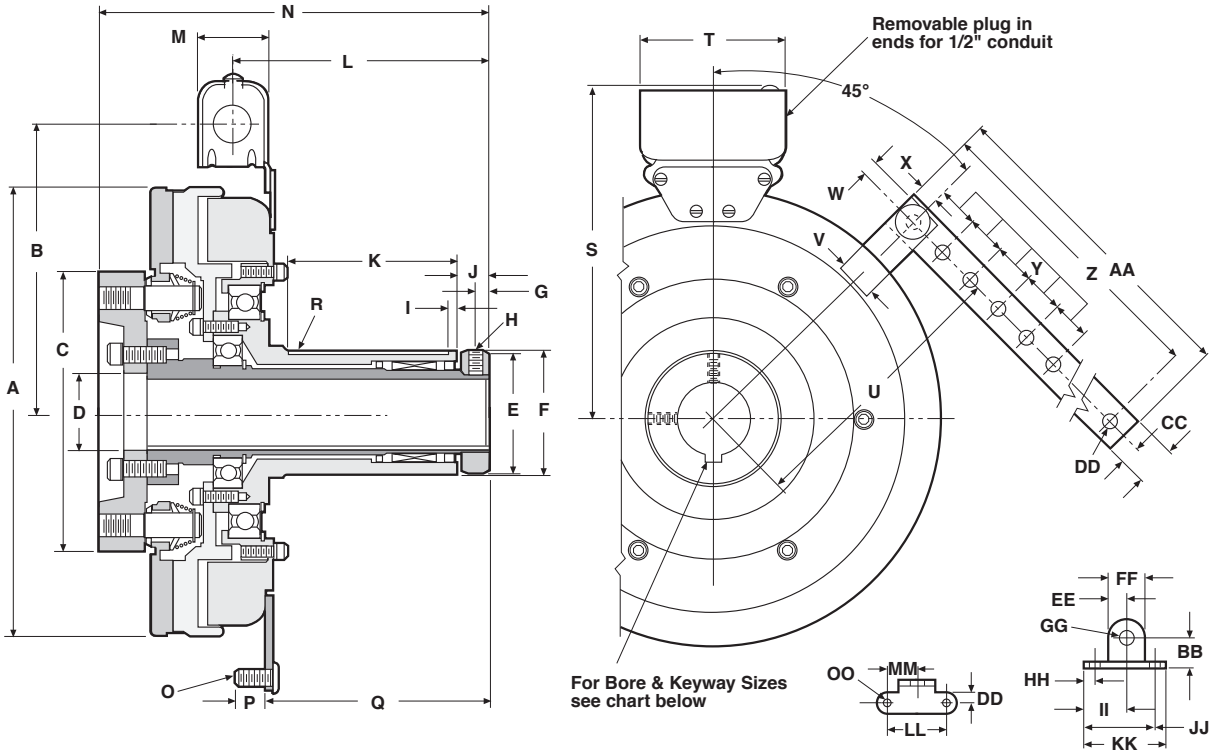
| Size | Y | Z | AA | BB | CC | DD | EE Dia. | FF | GG | HH Dia. | II |
|------|------|------|--------|------|------|-------|---------|------|-------|--------------|------|
| 375 | .563 | .750 | 5.000 | .250 | .500 | .750 | .563 | .313 | 1.000 | .270 .260 | .828 |
| 475 | .578 | .750 | 5.000 | .250 | .500 | .750 | .563 | .313 | 1.000 | .270 .260 | .828 |
| 650 | .563 | .750 | 10.000 | .250 | .500 | 5.750 | .563 | .313 | 1.000 | .270 .260 | .828 |

Specifications

| Size | Average Wt.-lbs. | | | | Inertia-WR ² (lb.ft. ²) | | | |
|--------|------------------|-------|--------------|--------------|--|-------|--------------|--------------|
| | Arm. & Carrier | Rotor | Outer Sleeve | Inner Sleeve | Arm. & Carrier | Rotor | Outer Sleeve | Inner Sleeve |
| EC-375 | .60 | .55 | .49 | .60 | .010 | .018 | .001 | .001 |
| EC-475 | 1.13 | 1.12 | .78 | 1.22 | .072 | .033 | .006 | .002 |
| EC-650 | 2.3 | 2.5 | 1.6 | 2.37 | .106 | .202 | .010 | .013 |

EC Series Electro Clutch

EC-825



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Dia. | C | D Min. | E Dia. | F Dia. | G | H | I | J |
|------|--------|--------|-------|--------|--------|------------------|------|-------------------------|------|------|
| 825 | 8.656 | 5.656 | 4.625 | 1.437 | 2.375 | 2.5000 2.4985 | .281 | 1/4-20 UNC -3A x 3/8 | .188 | .563 |

| Size | K Max. | L | M | N Max. | O | P | Q Max. | R* | S | T |
|------|--------|-------|-------|--------|----------------|-------|--------|------------|-------|-------|
| 825 | 3.047 | 5.219 | 1.547 | 8.000 | 5/16-18 UNC-2A | 1.547 | 4.468 | 5/8 x 3/32 | 6.813 | 3.750 |

| Size | U | V | W | X | Y | Z | AA | BB | CC | DD Dia. |
|------|-------|------|---|------|------|--------|----|------|------|--------------|
| 825 | 5.063 | .875 | — | .375 | .750 | 16.625 | 17 | .750 | .375 | .330 .321 |

| Size | EE | FF | GG Dia. | HH | II | JJ | KK | LL | MM | NN | OO |
|------|------|------|---------|------|-------|-------|-------|-------|------|------|--------------|
| 825 | .438 | .875 | .313 | .250 | 1.000 | 1.750 | 2.000 | 1.500 | .750 | .250 | .270 .260 |

* Key supplied

Specifications

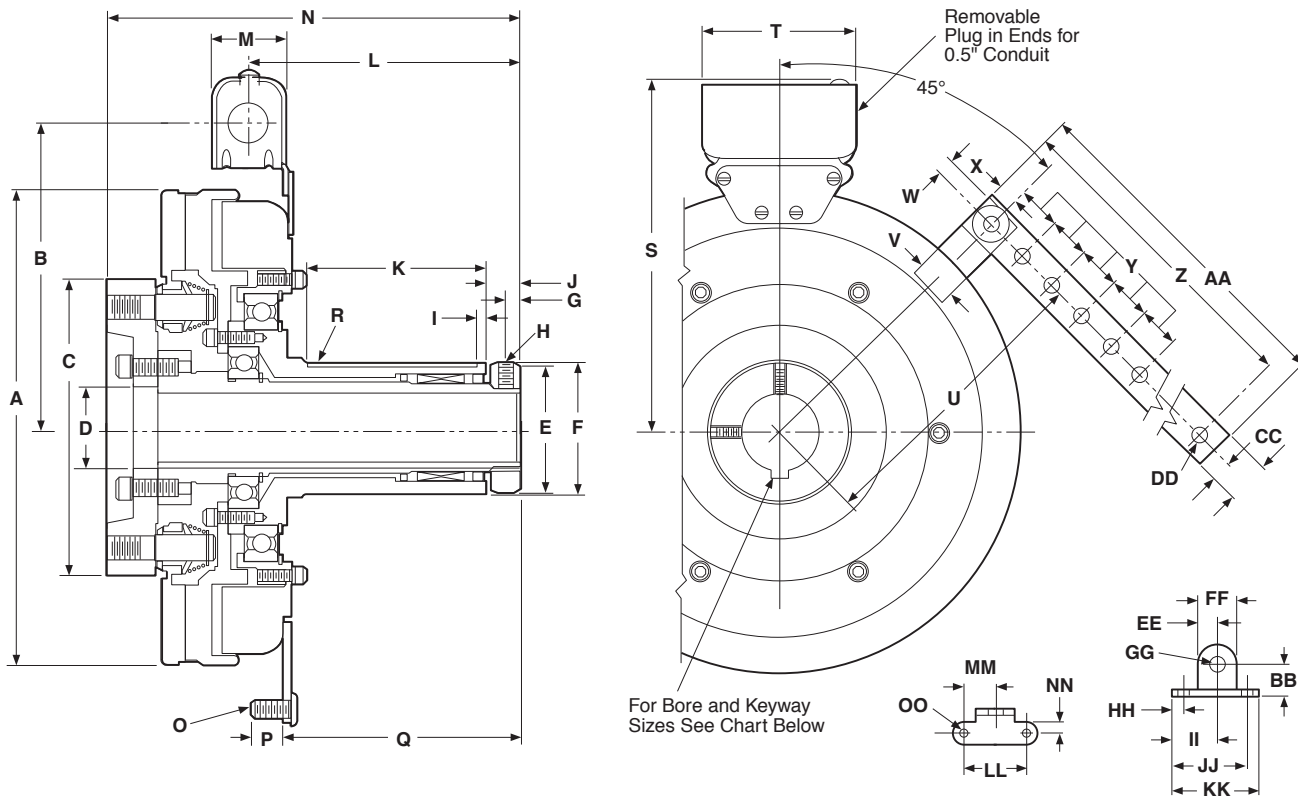
| Model Size | Voltage DC | Inertia-WR ² (lb. ft ²) | | Total Weight lbs. | Average Weight-lbs. | |
|------------|------------|--|----------------------|-------------------|------------------------------|----------------------|
| | | Armature, Hub & Inner Sleeve | Rotor & Outer Sleeve | | Armature, Hub & Inner Sleeve | Rotor & Outer Sleeve |
| EC-825 | 6 | .35 | .87 | 28 | 6.0 | 18.5 |
| | 24 | .35 | .87 | 28 | 6.0 | 18.5 |
| | 90 | .35 | .87 | 28 | 6.0 | 18.5 |

Bore Sizes and Keyways

| Size | Bore Dia. | Keyway |
|------|-----------|-------------|
| 825 | 1.125 | 1/4 x 1/8 |
| | 1.250 | 1/4 x 1/8 |
| | 1.375 | 5/16 x 3/32 |

EC Series Electro Clutch

EC-1000, EC-1225



Specifications

| Model Size | Voltage DC | Static Torque (lb. ft.) | Max. Speed RPM | Inertia-WR ² (lb. ft ²) | | | | Total Weight lbs. |
|------------|------------|-------------------------|----------------|--|-------|--------------|--------------|-------------------|
| | | | | Arm. & Hub | Rotor | Outer Sleeve | Inner Sleeve | |
| EC-1000 | 6 | 240 lb. ft. | 2000 | .720 | .894 | .129 | .036 | 41 |
| | 24 | 240 lb. ft. | 2000 | .720 | .894 | .129 | .036 | 41 |
| | 90 | 240 lb. ft. | 2000 | .720 | .894 | .129 | .036 | 41 |
| EC-1225 | 6 | 465 lb. ft. | 2000 | 1.8 | 2.4 | .129 | .061 | 85 |
| | 24 | 465 lb. ft. | 2000 | 1.8 | 2.4 | .129 | .061 | 85 |
| | 90 | 465 lb. ft. | 2000 | 1.8 | 2.4 | .129 | .061 | 85 |

EC Series Electro Clutch

EC-1000, EC-1225

Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Dia. | C | D Min. | E Dia. | F Dia. | G | H | I | J | K Max. | L | M |
|------|--------|--------|-------|--------|--------|------------------|------|--------------------------|------|------|--------|-------|-------|
| 1000 | 10.328 | 6.531 | 6.344 | 1.750 | 2.875 | 2.9375 2.9365 | .344 | 5/16-18 UNC -3A x 3/8 | .188 | .750 | 3.969 | 6.000 | 1.547 |
| 1225 | 12.672 | 7.531 | 6.969 | 2.234 | 3.625 | 3.750 3.749 | .406 | 5/81-16 UNC -3A x 3/4 | .375 | .859 | 5.219 | 7.781 | 1.547 |

| Size | N Max. | O | P | Q Max. | R* | S | T | U | V | W | X | Y |
|------|--------|----------------|-------|--------|-----------|-------|-------|-------|------|------|------|------|
| 1000 | 9.031 | 5/16-18 UNC-2A | 1.547 | 5.281 | 3/4 x 1/8 | 7.688 | 3.750 | 6.125 | .875 | .344 | .375 | .750 |
| 1225 | 11.016 | 5/16-18 UNC-2A | 1.547 | 7.047 | 7/8 x 1/8 | 8.688 | 3.750 | 7.000 | .875 | .344 | .375 | .750 |

| Size | Z | AA | BB | CC | DD Dia. | EE | FF | GG Dia. | HH | II | JJ | KK | LL | MM | NN | OO |
|------|--------|----|------|------|--------------|------|------|---------|------|-------|-------|-------|-------|------|------|--------------|
| 1000 | 16.625 | 17 | .750 | .375 | .330 .321 | .438 | .875 | .313 | .250 | 1.000 | 1.750 | 2.000 | 1.500 | .750 | .250 | .270 .260 |
| 1225 | 16.625 | 17 | .750 | .375 | .330 .321 | .438 | .875 | .313 | .250 | 1.000 | 1.750 | 2.000 | 1.500 | .750 | .250 | .270 .260 |

* Key supplied

Bore Sizes and Keyway

| Size | Bore Dia. | Keyway |
|------|-----------|--------------|
| 1000 | 1.375 | *5/15 x 5/32 |
| | 1.500 | *3/8 x 11/64 |
| | 1.625 | *3/8 x 1/8 |
| 1225 | 1.625 | *3/8 x 5/32 |
| | 1.875 | *1/2 x 1/4 |
| | 2.125 | *1/2 x 3/16 |

*Key Furnished

EB Series Electro Brake

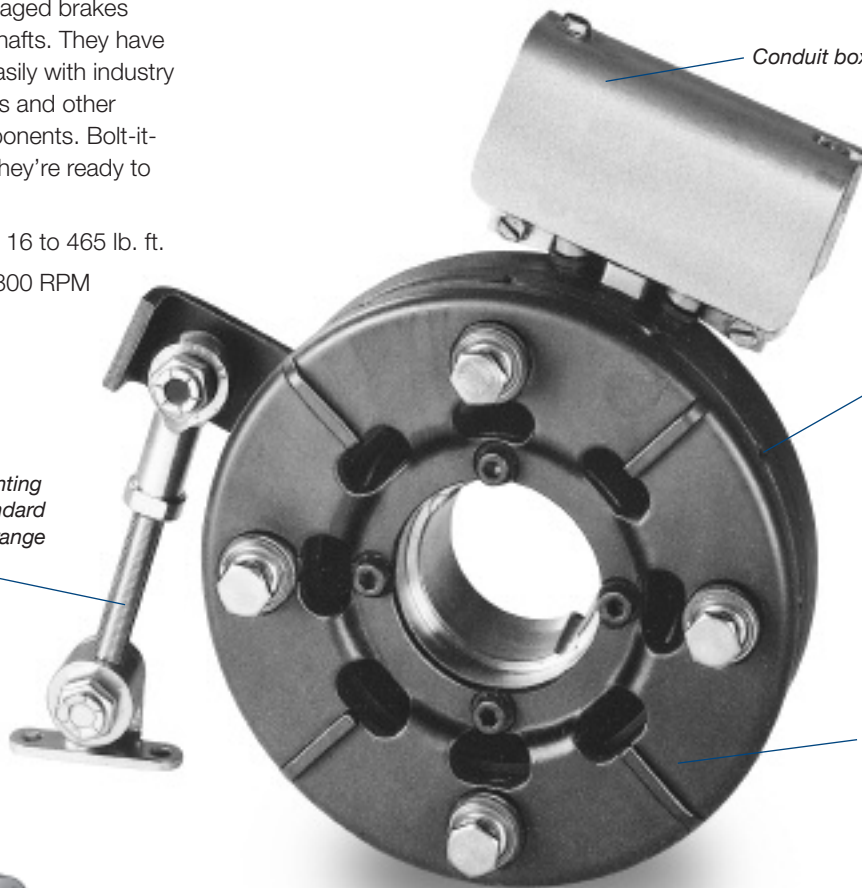
Shaft Mounted Brakes for Power-On Applications

Pre-engineered, pre-packaged brakes mount on motor or thru shafts. They have been designed to mate easily with industry standard motors, reducers and other power transmission components. Bolt-it-down and wire-it-up . . . they're ready to go.

- Wide torque range from 16 to 465 lb. ft.
- Handle 1 to 75 HP at 1800 RPM
- Adjustable torque arm

Mounting Flexibility

Torque arm allows mounting anywhere on shaft. Standard bushings cover a wide range of shaft sizes.



UL Listed

Conduit box meets industry standards.

Long Life, No Maintenance

Automatically adjusts for wear. Designed for maximum heat dissipation. No lubrication necessary.

Packaged Design

No assembly required. Insert bushing for proper shaft size, slide on shaft and bolt down torque arm.

Typical Application



An Electro Brake mounted on a through shaft.

Selection Procedure

1. Determine the motor horsepower and RPM at the brake location.
2. Use the Horsepower vs. Shaft Speed chart to determine the right size Electro Brake.
3. When ordering, specify bore size and voltage.
4. To get maximum performance from your Electro Clutch, use a Warner Electric Control. See the Controls Section.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT BRAKE (IN RPM) | | | | | | | | | | | | | | | | | | | | |
|-------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 | 5000 |
| 1/12 | | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | | | | | | | | |

Part Numbers

| Model Size | Bore Size | Voltage DC | Part No. |
|------------|----------------|------------|--------------|
| EB-375 | 1/2" | 6 | 5380-170-005 |
| | | 24 | 5380-170-006 |
| | | 90 | 5380-170-004 |
| | 5/8" | 6 | 5380-170-003 |
| | | 24 | 5380-170-007 |
| | | 90 | 5380-170-002 |
| EB-475 | 1/2" to 1" | 6 | 5381-170-003 |
| | | 24 | 5381-170-004 |
| | | 90 | 5381-170-002 |
| EB-650 | 1/2" to 1-3/8" | 6 | 5382-170-003 |
| | | 24 | 5382-170-005 |
| | | 90 | 5382-170-002 |
| EB-825 | 1/2" to 1-1/2" | 6 | 5383-170-002 |
| | | 24 | 5383-170-004 |
| | | 90 | 5383-170-005 |
| EB-1000 | 1/2" to 1-5/8" | 6 | 5384-170-003 |
| | | 24 | 5384-170-005 |
| | | 90 | 5384-170-002 |
| EB-1225 | 1/2" to 2-1/2" | 6 | 5385-170-003 |
| | | 24 | 5385-170-005 |
| | | 90 | 5385-170-002 |

Note: EB-375 also available in some metric bores.
EB-475-1225 use bushings which are available in metric bores.

Adapter Requirements

For thru-shaft mounting, specify bore size. For EB-475 and EB-650 order bushing separately. EB-375 does not require a bushing. (See pages 198 and 199)

For motor mounting, order adapter separate (see page 77).

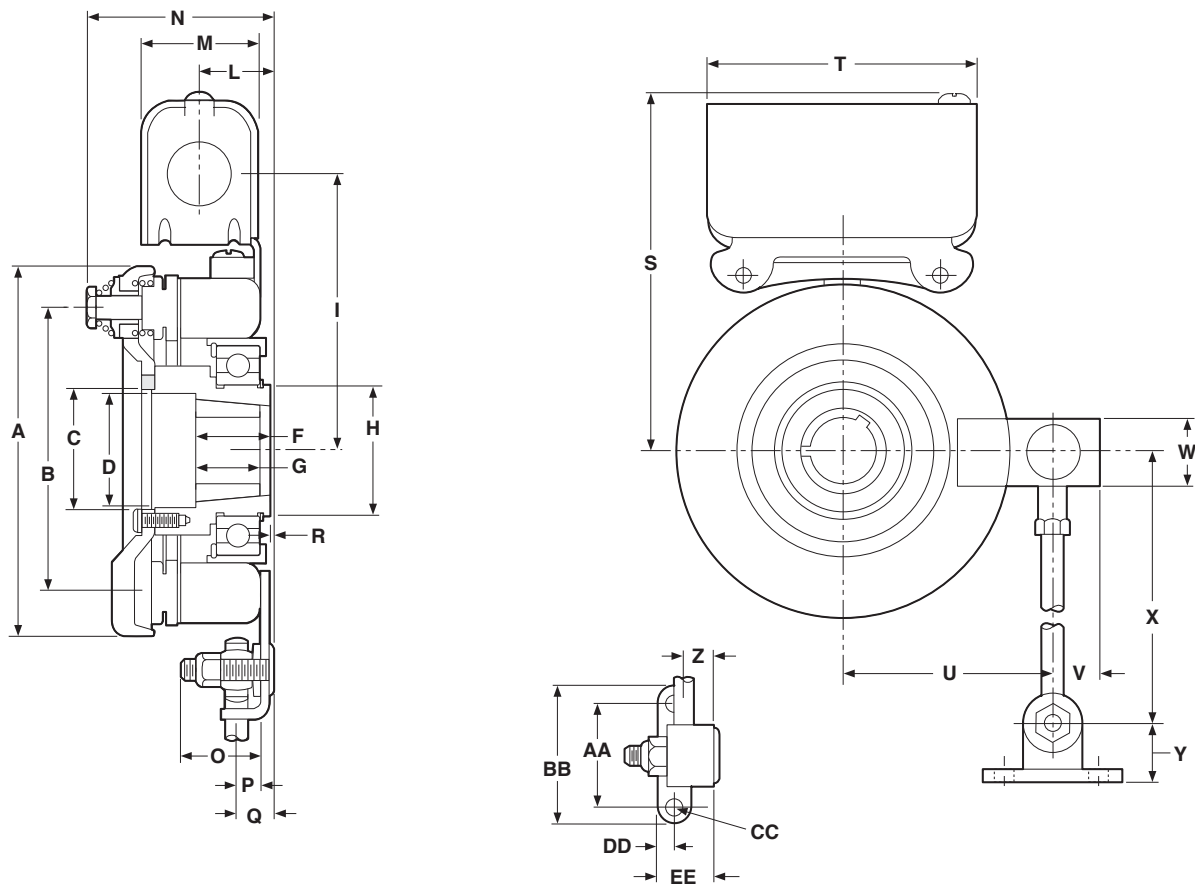
Bore Sizes and Keyway

| Size | Bore Dia. | Keyway |
|------|-------------|-------------|
| 375 | .501/.500 | 1/8 x 1/16 |
| | .626/.625 | 3/16 x 3/32 |
| 475 | .500/.563 | 1/8 x 1/16 |
| | .625/.875 | 3/16 x 3/32 |
| | .938/1.000 | *1/4 x 1/8 |
| 650 | .500/.563 | 1/8 x 1/16 |
| | .625/.875 | 3/16 x 3/32 |
| | 1.250/1.313 | 1/4 x 1/8 |
| | 1.313/1.375 | 5/16 x 5/32 |

*Key Furnished

EB Series Electro Brake

EB-375, EB-475, EB-650



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Dia. | C Min. | D Dia. | E | F | G | H Dia. | I | J | K | L | M | N Max. | O |
|------|--------|--------|--------|--------|------|-------|-------|--------|-------|------------------------|------|-------|-------|--------|-------|
| 375 | 4.078 | 3.125 | .7505 | - | .031 | 1.656 | - | 1.375 | 3.344 | 10-32 UNF -3A x 1/4 | .188 | 1.047 | 1.547 | 2.438 | .844 |
| 475 | 5.172 | 4.000 | 1.663 | 1.594 | - | 1.000 | 1.000 | 1.781 | 3.875 | - | - | .986 | 1.547 | 2.922 | 1.094 |
| 650 | 6.578 | 5.125 | 2.343 | 2.281 | - | 1.313 | 1.000 | 2.563 | 4.656 | - | - | .986 | 1.547 | 3.109 | 1.031 |

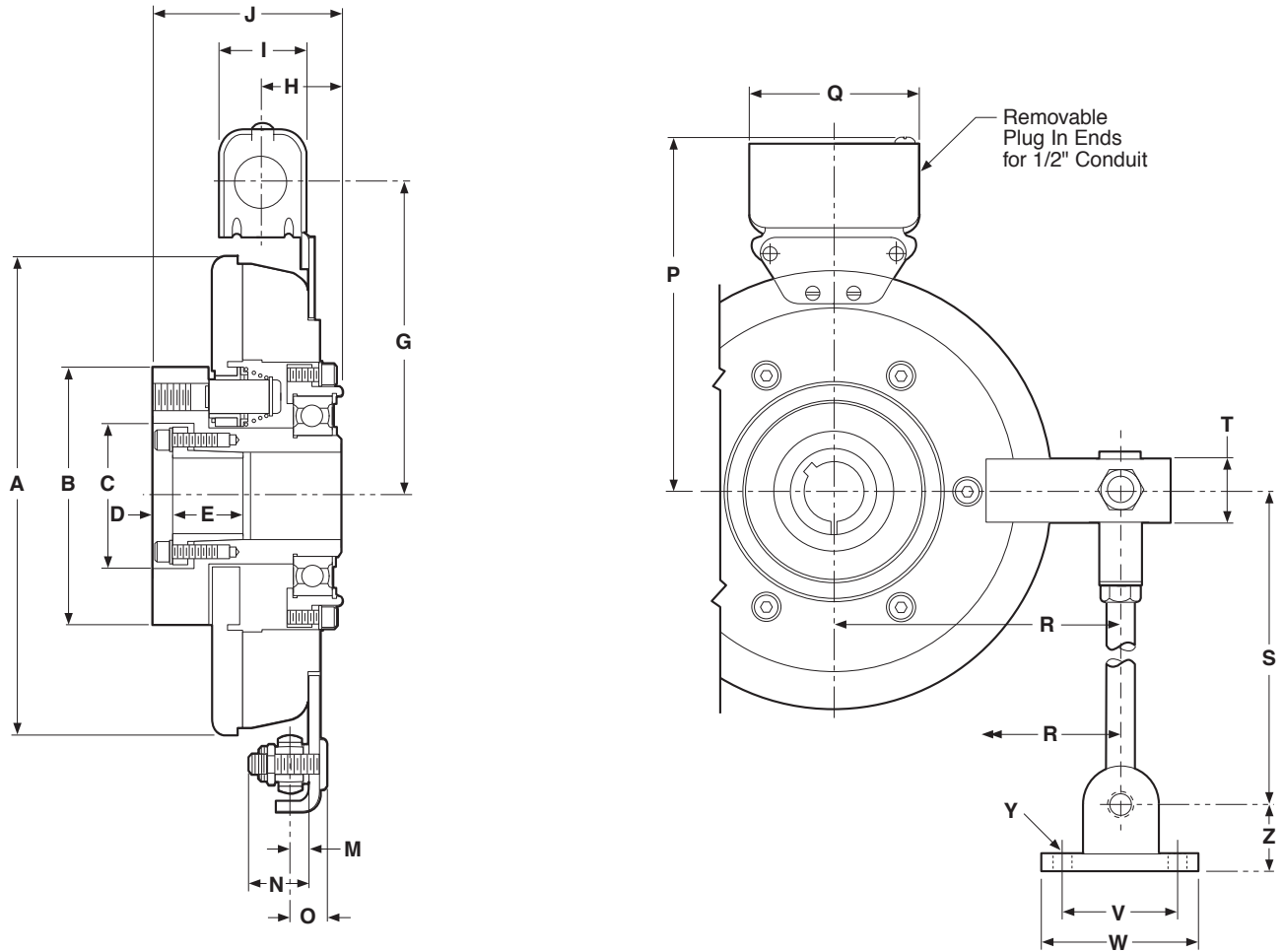
| Size | P | Q | R | S Max. | T | U | V | W | X | Y | Z | AA | BB | CC | DD | EE |
|------|------|------|--------------|--------|-------|-------|------|-------|--------|------|------|-------|-------|--------------|------|------|
| 375 | .281 | .625 | .094 Min. | 4.453 | 3.750 | 2.453 | .666 | 1.000 | 8.000 | .635 | .359 | 1.500 | 2.000 | .270 .260 | .250 | .781 |
| 475 | .313 | .531 | .125 Max. | 4.984 | 3.750 | 3.093 | .697 | 1.000 | 10.000 | .635 | .391 | 1.500 | 2.000 | .270 .260 | .250 | .781 |
| 650 | .344 | .641 | .203 Max. | 5.766 | 3.750 | 4.063 | .843 | 1.125 | 11.000 | .635 | .438 | 1.500 | 2.000 | .270 .260 | .250 | .781 |

Specifications

| Model Size | Voltage DC | Static Torque (lb. ft.) | Max. Speed RPM | Inertia-WR ² (lb. ft ²) | | Total Weight lbs. |
|------------|------------|-------------------------|----------------|--|------|-------------------|
| | | | | Arm. & Carrier | Hub | |
| EB-375 | 6, 24, 90 | 16 | 5000 | .010 | .001 | 4 |
| EB-475 | 6, 24, 90 | 30 | 4500 | .072 | .006 | 7 |
| EB-650 | 6, 24, 90 | 95 | 3600 | .106 | .010 | 11.3 |

EB Series Electro Brake

EB-825



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Max. | C Dia. | D | E | F | G | H | I | J Max. | K | L | M |
|------|--------|--------|--------|------|-------|---|-------|-------|-------|--------|---|---|------|
| 825 | 8.656 | 4.625 | 2.625 | .563 | 1.250 | - | 5.281 | 1.344 | 1.547 | 3.375 | - | - | .344 |

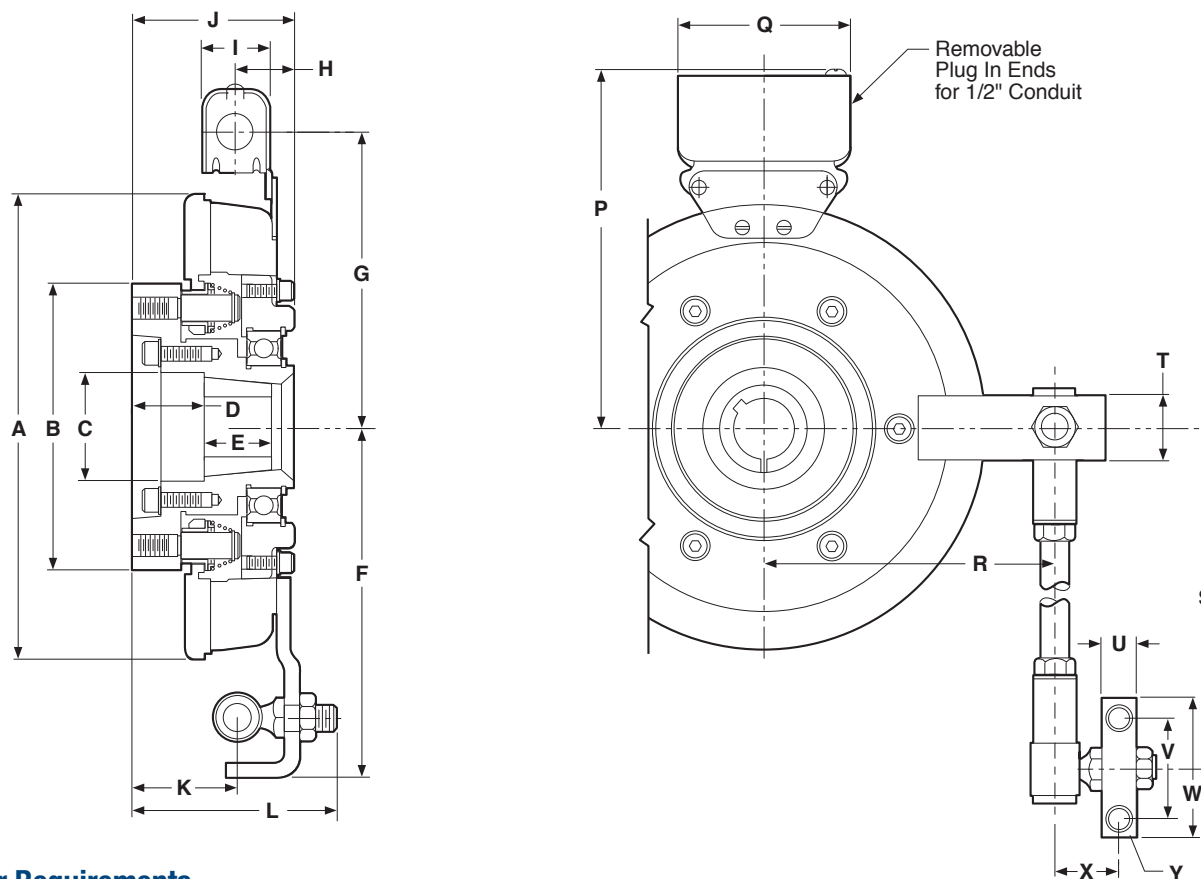
| Size | N | O | P Max. | Q | R | S | T | U | V | W | X | Y | Z |
|------|-------|------|--------|-------|-------|--------|-------|---|-------|-------|---|--------------|------|
| 825 | 1.031 | .641 | 6.813 | 3.750 | 4.813 | 11.000 | 1.125 | - | 1.500 | 2.000 | - | .270 .260 | .781 |

Specifications

| Model Size | Voltage DC | Static Torque lb. ft. | Max. Speed RPM | Inertia-WR ² (lb. ft. ²) Arm. & Hub | Total Weight lbs. |
|------------|------------|-----------------------|----------------|---|-------------------|
| EB-825 | 6, 24, 90 | 125 | 3600 | .459 | 20 |

EB Series Electro Brake

EB-1000, EB-1225



Adapter Requirements

For thru-shaft mounting, specify bore size. Order bushing separately.
 For motor mounting order adapter separate (see page 77).

Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Max. | C Dia. | D | E | F | G | H | I | J Max. | K | L | M |
|------|--------|--------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|---|
| 1000 | 10.328 | 6.344 | 2.563 | 1.563 | 1.500 | 7.688 | 6.531 | 1.281 | 1.547 | 3.531 | 2.266 | 4.531 | - |
| 1225 | 12.672 | 6.969 | 3.391 | .875 | 1.750 | 8.438 | 7.531 | 1.297 | 1.547 | 3.719 | 2.453 | 4.703 | - |

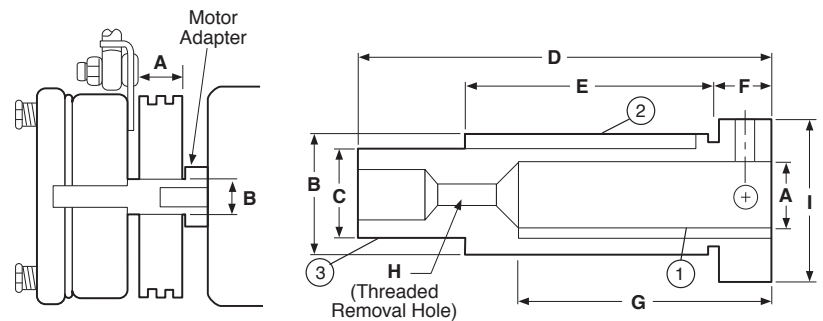
| Size | N | O | P Max. | Q | R | S | T | U | V | W | X | Y | Z |
|------|---|---|--------|-------|---|--------|-------|------|-------|-------|-------|--------------|---|
| 1000 | - | - | 7.688 | 3.750 | - | 18.000 | 1.500 | .750 | .2375 | 3.375 | 1.438 | .413 .404 | - |
| 1225 | - | - | 8.688 | 3.750 | - | 18.000 | 1.500 | .750 | 2.375 | 3.375 | 1.438 | .413 .404 | - |

Specifications

| Model Size | Voltage DC | Static Torque lb. ft. | Max. Speed RPM | Inertia-WR ² (lb. ft ²) | | Total Weight lbs. |
|------------|------------|-----------------------|----------------|--|------|-------------------|
| | | | | Arm. & Hub | Hub | |
| EB-1000 | 6, 24, 90 | 240 | 2000 | .720 | .129 | 35.5 |
| EB-1225 | 6, 24, 90 | 465 | 2000 | 1.8 | .129 | 52.5 |

Optional Motor Shaft Adapter

Ten motor shaft adapters are available as an option for mounting Electro-Brakes on single shaft extension motors. For double shaft extension motors the adapter can be eliminated. A standard sheave, pulley, or sprocket, with either a tapered bushing or straight bore, can be installed on the shaft adapter. The Electro Brake is mounted on the end of the shaft adapter and the complete assembly fits onto the motor shaft and is secured with setscrews. Fitting the belts or chain and attaching the torque arm completes the installation.



Dimensions

All dimensions are nominal, unless otherwise noted.

| Model | A | Kwy. | Key Part No. ① | B | Kwy. | Key Part No. ② | C | Kwy. | Key Part No. ③ | Dodge Bushing Size | D | E | F | G | H | I |
|---------|-------|---------------|----------------|---------|---------------|----------------|-------|---------------|----------------|--------------------|------------------|-------|--------------|-------|---------------|-------|
| EB-375 | 5/8 | 3/16x 3/32 | * | 7/8 | 3/16x 3/32 | 590-0016 | 5/8 | 3/16x 3/32 | 590-0043 | None | 4.391 4.359 | 2 | .391 .359 | 2 | 1/4-20 UNC | 1.125 |
| EB-375 | 7/8 | 3/16x 3/32 | * | 1-1/4 | 1/4x 1/8 | 590-0022 | 5/8 | 3/16x 3/32 | 590-0043 | None | 4.578 4.742 | 2-1/4 | .516 .484 | 2-1/4 | | 1.500 |
| EB-475 | 1-1/8 | 1/4x 1/8 | * | 1-5/8 | 3/8x 3/16 | 590-0041 | 1 | 1/4x 1/8 | ** | #1008 1" | 4.516 4.484 | 2-3/4 | .641 .609 | 2-3/4 | 1/2-13 UNC | 1.750 |
| EB-650 | 1-3/8 | 5/16x 5/32 | * | 2 | 1/2x 1/4 | 590-0042 | 1-3/8 | 5/16x 5/32 | 590-0044 | #1310 1-3/8" | 5.547 5.515 | 3-3/8 | .641 .609 | 3-3/8 | 1/2-13 UNC | 2.125 |
| EB-650 | 1-5/8 | 3/8x 3/16 | * | 2-1/4 | 1/2x 1/4 | 590-0042 | 1-3/8 | 5/16x 5/32 | 590-0044 | #1310 1-3/8" | 6.172 6.140 | 4 | .641 .609 | 4 | | 2.375 |
| EB-1000 | 1-5/8 | 3/8x 3/16 | * | 2-15/16 | 3/4x 7/16 | 590-0052 | 1-5/8 | 3/8x 7/32 | ** | #1615 1-5/8" | 8.297 8.265 | 5-1/4 | | 5 | 3/4-10 UNC | 2.937 |
| EB-1000 | 1-7/8 | 1/2x 7/32 | * | 2-15/16 | 3/4x 7/16 | 590-0052 | 1-5/8 | 3/8x 7/32 | ** | #1615 1-5/8" | | | | | | 2.937 |
| EB-1000 | 2-1/8 | 1/2x 1/8 | 590-0062 | 2-15/16 | 3/4x 5/16 | 590-0069 | 1-5/8 | 3/8x 7/32 | ** | #1615 1-5/8" | | | | | | 2.937 |
| EB-1225 | 2-1/8 | 1/2x 7/32 | * | 3-3/4 | 7/8x 7/16 | 590-0049 | 2-1/8 | 1/2x 9/32 | 590-0048 | #2517 2-1/8" | 10.672 10.640 | 7-1/4 | | 6-7/8 | 7/8-9 UNC | 3.750 |
| EB-1225 | 2-3/8 | 5/8x 9/32 | * | 3-3/4 | 7/8x 7/16 | 590-0049 | 2-1/8 | 1/2x 9/32 | 590-0048 | #2517 2-1/8" | | | | | | 3.750 |

*Standard Square Key Furnished with Motor.

**Special Key Furnished with Bushing.

Note: For adapter part numbers, see Service Parts beginning on page 276.

ATC / ATB Series AT Clutches and Brakes

Rugged, Durable, Heavy Duty Clutches and Brakes

Warner Electric's AT clutches and brakes are rugged and durable.

The ATC and ATB incorporate a molded friction material/pole assembly and replaceable armature faces with a rugged, durable clutch and brake assembly. Uniquely designed for ease of application and low maintenance.

Besides providing the ultimate in long life and durability, the AT units are easily repairable. Mounting a standard sheave, pulley or sprocket to the clutch is a snap.

The AT Clutches and Brakes feature a replaceable friction face. The results are long life, efficient operation, and minimal down time. Service kits of pre-selected parts enhance unit life.

ATC's and ATB's are completely assembled at the factory and have been specifically designed to match the torque ratings of standard motors, reducers, and other power transmission components. Easy-to-select and easy-to-install.

AT Clutches and Brakes are ideally suited for extremely rugged, heavy duty application demands.



Advanced Technology Design Advantages

- Replaceable friction face
- Steel wear surface and cast iron hub/armature carrier
- Non-asbestos, split molded friction disc.
- Autogap™ provides automatic wear take-up for consistent engagement.
- Cast iron components—finned, cast iron armature carriers
- Special coil design for high temperature operation.
- Sealed heavy duty bearings
- Rugged spline drive operation
- Easy to install
- Maintenance free

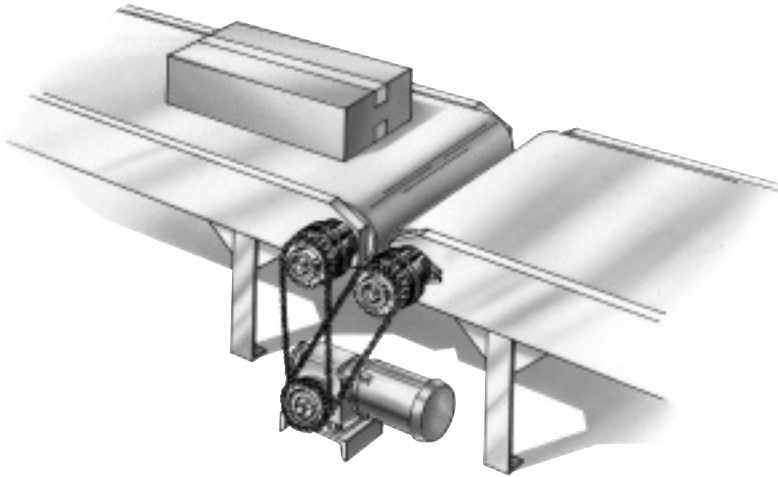
Options and Accessories

Warner Electric offers accessories and repair kits for AT clutches and brakes, including:

- Clutch field restraining straps
- Brake torque arms
- Conduit boxes
- Clutch pulleys
- Service kits

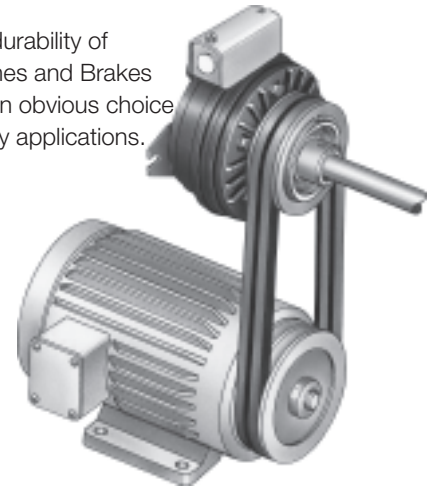
ATC / ATB Series AT Clutches and Brakes

Applications/Mounting Configurations

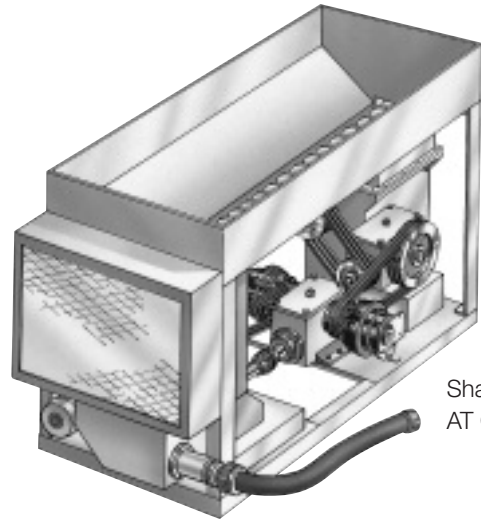
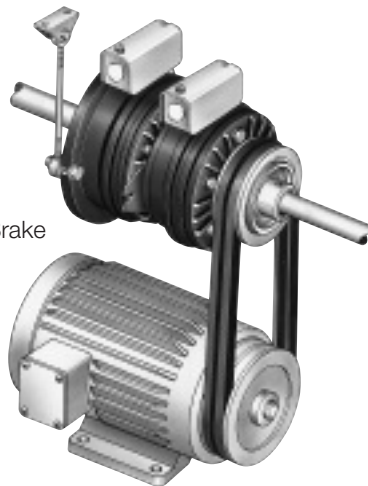


Two AT Clutches, easily mounted on conveyor headshafts, allow conveyor sections to be separately powered from a single drive.

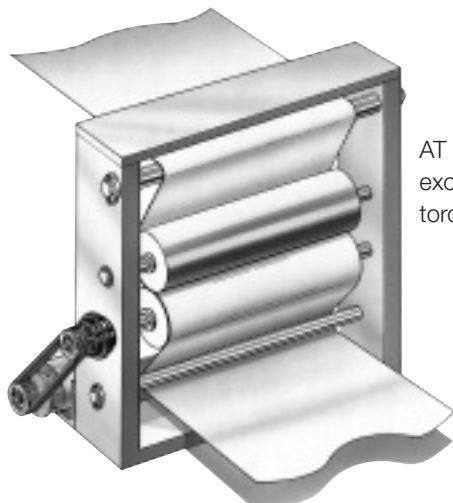
The rugged durability of the AT Clutches and Brakes make them an obvious choice for heavy duty applications.



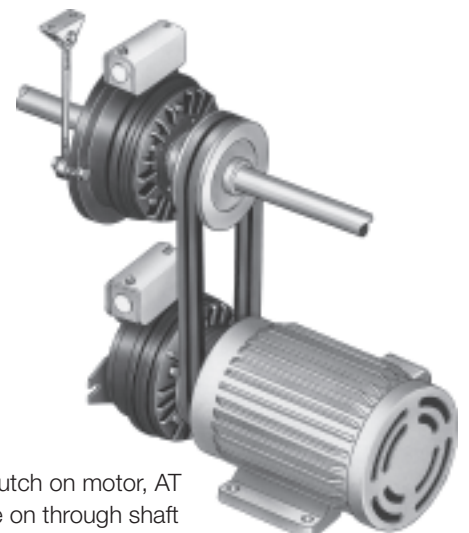
AT Clutch and AT Brake on through shaft



Shaft mounted AT Clutch



AT Clutches and Brakes are excellent for controlled torque applications.



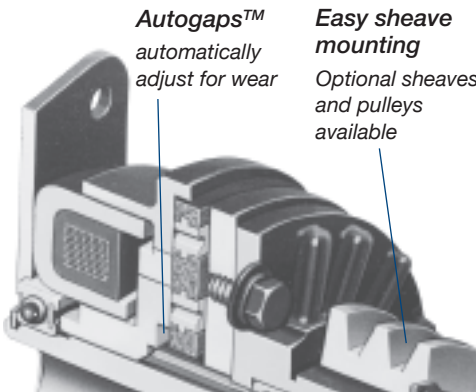
AT Clutch on motor, AT Brake on through shaft

ATC / ATB Series AT Clutches and Brakes

Performance Advantages

Principle of Operation

Ease of control is one of the most outstanding features of Warner Electric brakes and clutches. In operation, a magnetic field is generated as soon as current flows through the magnet coil. The magnetic poles are molded into a replaceable disc with the friction material. The electromagnetic force from the field or magnet passes through the poles to attract the armature, clamping the two together tightly. Strength of the magnetic field is directly proportional to the amount of current applied. The full torque range is completely controllable from 0 to 100% simply by turning the knob on the appropriate Warner Electric control.

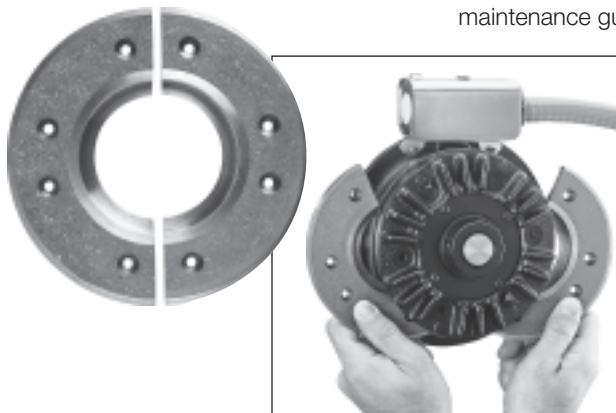


Replaceable Friction Discs

The AT Electric Clutches and Brakes feature a patented replaceable friction face incorporating a unique combination of electromagnetic poles and friction material in a simple component. Easily visible friction disc indicates when replacement is necessary—providing a helpful maintenance guide. The results are long

life, efficient operation, and minimal down time. Rebuild kits of pre-selected parts enhance unit life.

The split friction disc and armature are replaceable without unit disassembly in less than 5 minutes in most applications.



Autogap™

Alignment

Provides for automatic adjustment of the air gap between the wearing friction surfaces. Engagement times are consistent to maintain stopping and starting accuracy for the entire life of the unit.

Technical Considerations

Most normal duty applications will usually require a selection based only on horsepower and speed at the clutch or brake location as indicated on pages 83, 84 and 88. However, to insure the best possible overall performance and the most cost effective unit size selection, additional factors should be considered.

The main criteria are:

1. Horsepower
2. RPM
3. System inertia at the clutch or brake
4. Cycle rate and start/stop time
5. Static torque requirement, if any.

For instance, the HP and RPM sizing derived from the selection chart on page 84, may be different than the size required by the system inertia and cycle rate. In that case, the proper size is the larger size unit. Additional application information makes a very accurate and exacting unit size selection possible. To achieve this, system inertia and required cycle rate must be known.

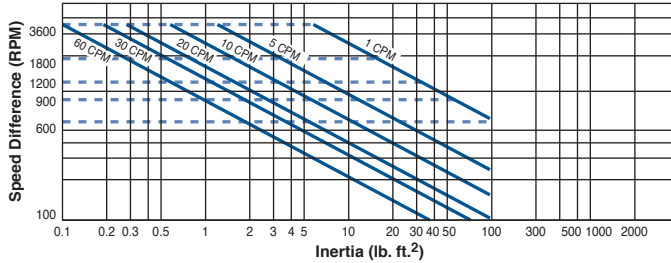
Cycle Rate

Cycle rate capability is often an important selection criteria. Cycle rate is usually defined as the number of times the clutch and/or brake is switched on and off in a minute or Cycles per Minute (CPM). In order to determine the correct size unit, both required cycle rate and reflected inertia must be known. The inertia of the AT clutch/brake components has been factored into the charts, so these need not be considered. To determine size from the charts:

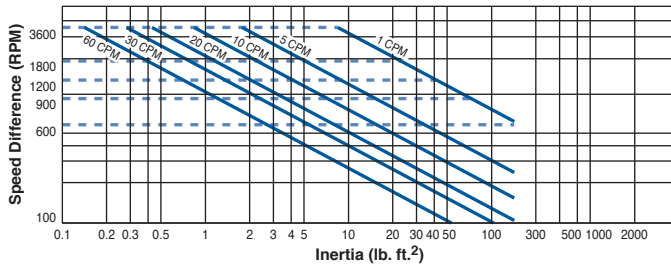
1. Estimate the size clutch or brake.
2. Read the chart for that size. The intersection of the reflected inertia (lb. ft.²) and speed difference (RPM) lines will indicate the maximum cycle rate for that size unit.
3. Compare cycle rates. If the cycle rate required falls within the units capability, proceed to step 4 below. If the required cycle rate is above the size selected, go to the next larger AT unit.
4. Verify selection. Compare the size selected in 2 and 3 above to the Horsepower/Speed simple selection made on page 84. If the size selected is not the same, choose the larger selected by the two methods.

Cycle Rate Capability

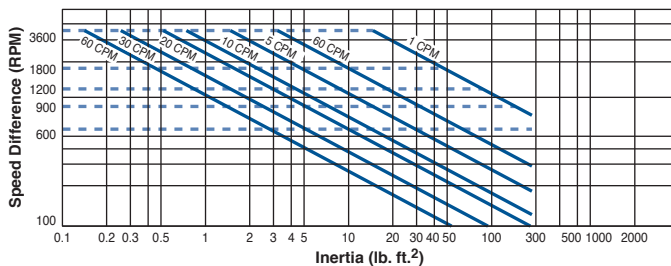
ATC 25/ATB 25



ATC 55/ATB 55

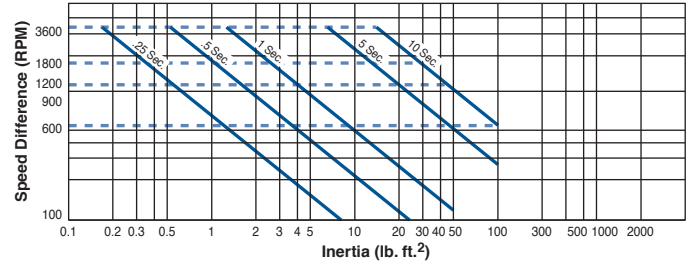


ATC 115/ATB 115

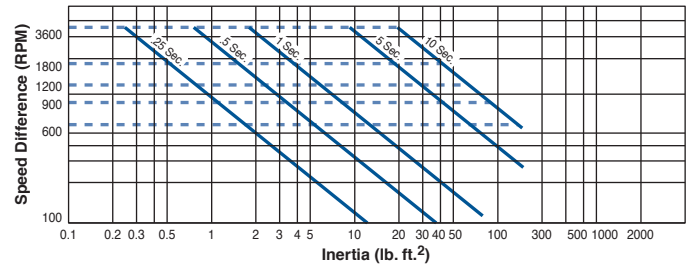


Stop/Start Time Capability

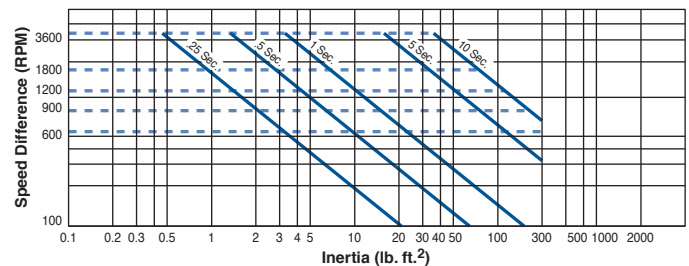
ATC 25/ATB 25



ATC 55/ATB 55



ATC 115/ATB 115



Start/Stop Times

In some applications, accelerating and/or decelerating the load within a specific time is a critical factor. In these start/stop time charts, AT unit inertias have already been factored in, so only reflected inertia need be considered. Selection for start/stop times can be made as follows:

1. Estimate the size clutch or brake required.
2. Read the chart for that size. Cross reference the speed difference (RPM) with the reflected inertia (lb. ft.²) to find the maximum start/stop capability for that size unit.
3. Compare start/stop times. If the start/stop time is equal to or less than that required for that application, the correct size unit has been selected. If shorter start/stop times are required, repeat the procedure on the chart for the next larger size unit.
4. Verify the selection. Compare the unit size chosen in steps 1, 2, and 3 to the unit size chosen by the simple Horsepower/Speed method on page 84. If the sizes selected are not identical, choose the larger selected by the two methods.

ATC Series AT Clutch

Rugged and Durable Operation

Autogaps™

automatically adjust for wear.

Rugged spline drive

for maximum durability.

Sealed, high temperature.

UL recognized.

Rugged steel wear surface

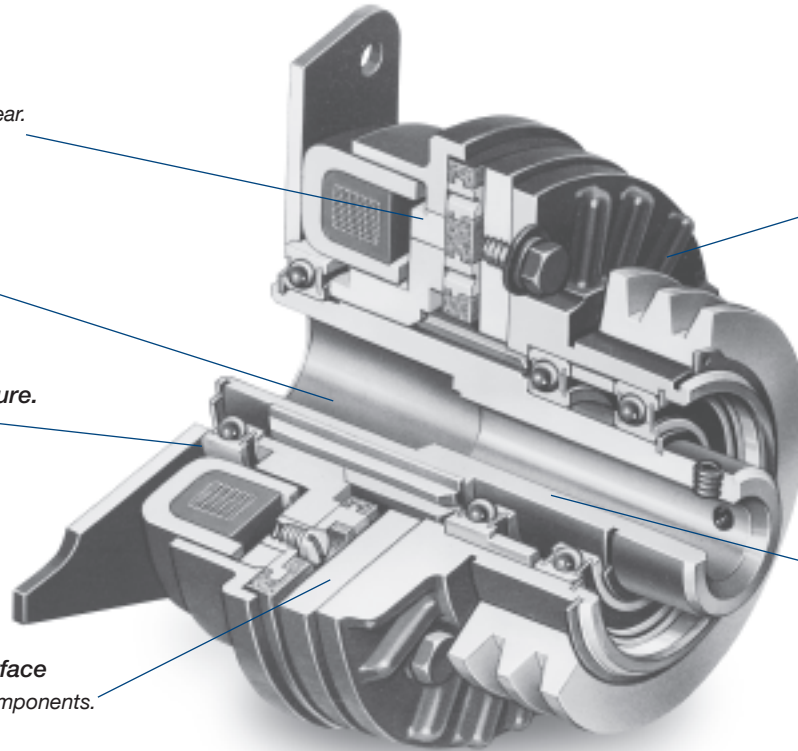
and precision cast iron components.

Easy sheave mounting.

Optional sheaves and pulleys available from Warner Electric.

Sealed heavy duty bearings

with high temperature lubricant.



Mounting Flexibility

The ATC clutch design represents the best combination of features to allow mounting of the widest range of pulleys, sheaves or sprockets with keys and snap rings or bolts for maximum durability. The pulleys or sheaves selected as standard offerings to

support the line are matched to the torque capability of each clutch. The torques and wear lives have been designed to match industry-standard motors and reducers by shaft size and bore size.

Selection

1. Determine Model Size

Determine the motor horsepower and shaft speed (in R.P.M.) at the clutch location.

The correct size unit is shown at the intersection of HP and shaft speed.

2. Determine Bore Size

Select bore size and determine part number for correct size clutch from parts lists starting on page 85.

3. Select Options

Refer to the Standard Sheaves and Pulley chart to choose an optional Warner Electric standard pulley or obtain information for fitting other pulley or sprocket.

4. Select Control

A simple, built-in AC to DC control is optional for 90 volt AT Clutches.

Complete control information is found in the Controls Section.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | | | |

Selection/Ordering Information

Optional Equipment

Standard Sheaves and Pulleys

| Sheave Pulley Type | Clutch or Brake Size | No. Grooves No. Teeth | Part Number | Pitch Diameter | Width | Dimensions O.D. |
|--------------------|----------------------|-----------------------|-------------|----------------|--------|-----------------|
| Timing Belt | 25 | 26H100 | 689-0256 | 4.138" | 1.312" | 4.244" |
| | 55 | 30H100 | 689-0278 | 4.755" | 1.312" | 4.881" |
| | 115 | 40H150 | 689-0257 | 6.366" | 1.812" | 6.472" |
| "A" Section | 25 | 1G3.60 | 689-0267 | 3.600" | .750" | 3.850" |
| | 55 | 2G4.80 | 689-0308 | 4.800" | 1.445" | 5.050" |
| | 115 | 3G6.00 | 689-0271 | 6.000" | 2.000" | 6.250" |
| "3V" Section | 25 | 1G3.65 | 689-0259 | 3.600" | .695" | 3.650" |
| | 55 | 2G4.12 | 689-0315 | 4.070" | 1.094" | 4.120" |
| | 115 | 3G5.30 | 689-0263 | 5.250" | 1.515" | 5.300" |
| "B" Section | 115 | 2G6.00 | 689-0275 | 6.000" | 1.750" | 6.350" |

Other Sheaves, Pulleys and Sprockets

The unique AT Clutch design permits the installation of any customer provided sheave, pulley or sprocket that can be bored out and key seated to the Bore-to-Size dimensions shown on page 87.

Sprockets

The AT clutch design permits installation of customer supplied sprockets. Minimum size sprocket requirements found in the chart below can be bored out and drilled to the dimensions in that chart.

Part Numbers

| Model Size | Bore Size | Voltage DC | Part No. |
|------------|-----------|------------|--------------|
| ATC-25 | 1/2" | 6 | 5161-271-002 |
| | | 24 | 5161-271-010 |
| | | 90 | 5161-271-003 |
| | 5/8" | 6 | 5161-271-004 |
| | | 24 | 5161-271-011 |
| | | 90 | 5161-271-005 |
| | 3/4" | 6 | 5161-271-006 |
| | | 24 | 5161-271-012 |
| | | 90 | 5161-271-007 |
| | 7/8" | 6 | 5161-271-008 |
| | | 24 | 5161-271-013 |
| | | 90 | 5161-271-009 |
| ATC-55 | 3/4" | 6 | 5162-271-002 |
| | | 24 | 5162-271-010 |
| | | 90 | 5162-271-003 |
| | 7/8" | 6 | 5162-271-004 |
| | | 24 | 5162-271-011 |
| | | 90 | 5162-271-005 |
| | 1" | 6 | 5162-271-006 |
| | | 24 | 5162-271-012 |
| | | 90 | 5162-271-007 |
| | 1-1/8" | 6 | 5162-271-008 |
| | | 24 | 5162-271-013 |
| | | 90 | 5162-271-009 |
| ATC-115 | 1-1/8" | 6 | 5163-271-002 |
| | | 24 | 5163-271-010 |
| | | 90 | 5163-271-003 |
| | 1-1/4" | 6 | 5163-271-004 |
| | | 24 | 5163-271-011 |
| | | 90 | 5163-271-005 |
| | 1-3/8" | 6 | 5163-271-006 |
| | | 24 | 5163-271-012 |
| | | 90 | 5163-271-007 |
| | 1-1/2" | 6 | 5163-271-008 |
| | | 24 | 5163-271-013 |
| | | 90 | 5163-271-009 |

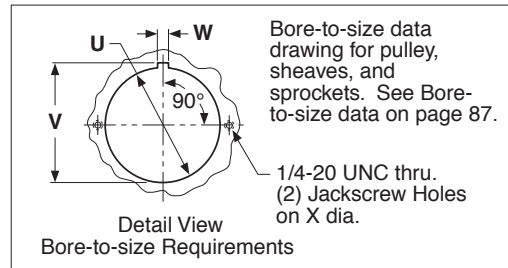
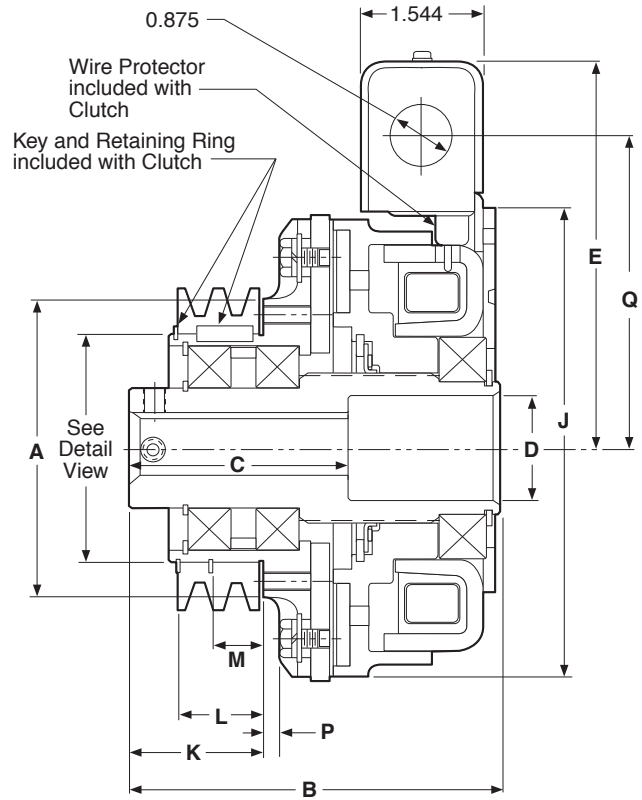
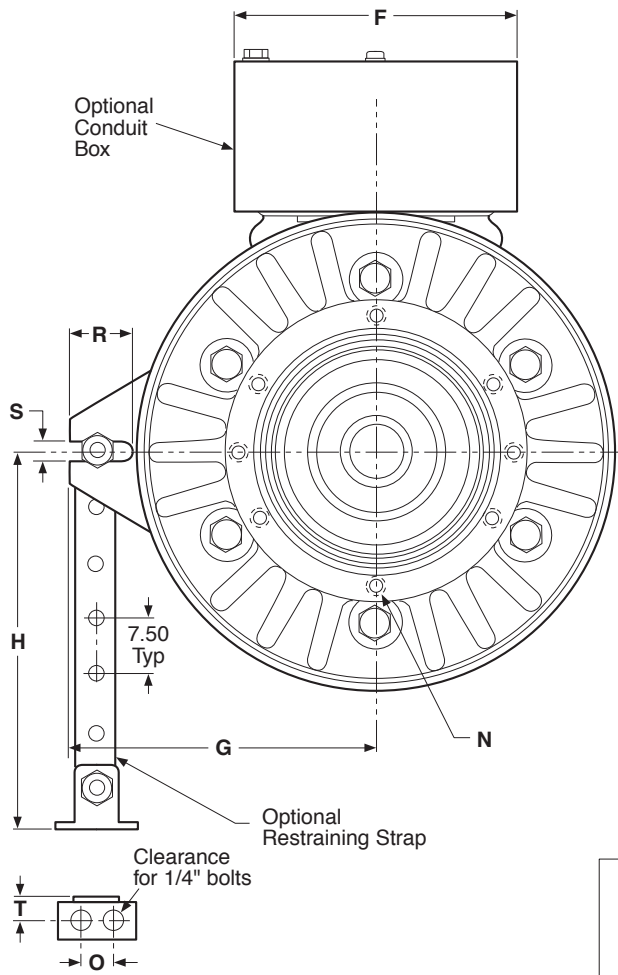
Minimum Size Sprockets for Pilot Mount

| Chain Size | Clutch Size | | |
|---------------------|---------------------------------|---------------------------------|----------------------------------|
| | 25 | 55 | 115 |
| 25 | 54T | — | — |
| 35 | 35T | 40T | — |
| 41/40 | 28T | 30T | 40T |
| 50 | 22T | 24T | 30T |
| 60 | — | 20T | 24T |
| 80 | — | — | 20T |
| 100 | — | — | — |
| 120 | — | — | — |
| Bore size | 2.500/2.502/ (63.500/63.551) | 3.000/3.002/ (76.200/76.251) | 4.00/4.002/ (101.600/101.651) |
| Bolt Circle | 3.000/(76.200) | 3.500/(88.900) | 4.750/(120.650) |
| No. Holes and Sizes | (3) .281/[(3) 7.144] | (4) .281/[(4) 7.144] | (4) .344/[(4) 8.731] |

Note: Spacer may be required to avoid chain interference with clutch.

ATC Series AT Clutch

ATC-25, ATC-55, ATC-115



Specifications

| Model Size | Voltage DC | Unit | Inertia*-WR ² (lb.ft. ²) | Max. RPM | Weight (lbs.) | Static Torque (lb.ft.) | Dynamic Torque @ 1800 RPM |
|------------|------------|--------|---|----------|---------------|------------------------|---------------------------|
| 25 | 6 | Clutch | .048 | 3600 | 8 | 25 | 12 lb. ft. |
| | 24 | | .048 | 3600 | 8 | 25 | 12 lb. ft. |
| | 90 | | .048 | 3600 | 8 | 25 | 12 lb. ft. |
| 55 | 6 | Clutch | .173 | 3600 | 18 | 55 | 20 lb. ft. |
| | 24 | | .173 | 3600 | 18 | 55 | 20 lb. ft. |
| | 90 | | .173 | 3600 | 18 | 55 | 20 lb. ft. |
| 115 | 6 | Clutch | .483 | 3600 | 28 | 115 | 30 lb. ft. |
| | 24 | | .483 | 3600 | 28 | 115 | 30 lb. ft. |
| | 90 | | .483 | 3600 | 28 | 115 | 30 lb. ft. |

ATC Series AT Clutch

ATC-25, ATC-55, ATC115

Dimensions

All dimensions are nominal, unless otherwise noted.

| Model | A Max. Dia. | B Max. | C Nom. | D Nom. Dia. | E Max. | F Max. | G Max. | H Max. | J Max. Dia. | K Max. | L Nom. | M Max. | T Nom. |
|-------|--------------------|--------------------|-------------------|-------------------|--------------------|-------------------|--------------------|--------------------|--------------------|-------------------|------------------------------|----------------------------|----------------|
| 25 | 3.60 (91.44) | 4.39 (111.51) | 2.375 (60.33) | 1.080 (27.43) | 4.748 (120.60) | 3.767 (95.68) | 3.282 (83.36) | 5.11 (129.79) | 4.822 (122.49) | 1.68 (42.67) | 1.003/.991 (25.48/25.17) | .715/.703 (18.16/17.86) | .375 (9.53) |
| 55 | 3.95 (100.33) | 4.935 (125.35) | 2.925 (74.30) | 1.40 (35.56) | 5.182 (131.62) | 3.767 (95.682) | 4.032 (102.412) | 5.11 (129.792) | 6.275 (159.39) | 1.817 (46.152) | 1.113/1.101 (28.27/27.97) | - | .375 (9.53) |
| 115 | 5.254 (133.452) | 5.977 (151.822) | 3.102 (78.792) | 1.86 (47.242) | 6.089 (154.662) | 3.767 (95.682) | 4.246 (107.852) | 10.11 (256.792) | 7.906 (200.812) | 2.467 (62.662) | 1.539/1.523 (39.09/38.68) | - | .375 (9.53) |

| Model | No. of Holes | N Thread Size | Max. Depth | Bolt Circle | O Nom. | P Nom. | Q Nom. | R Min. | S Min. |
|-------|-----------------|------------------|---------------|----------------|----------------|----------------|-------------------|-----------------|----------------|
| 25 | 3 | 1/4-20 | .500 | 3.00 | .500 (12.7) | .036 (0.91) | 3.586 (91.10) | .752 (19.08) | .279 (7.09) |
| 55 | 4 | 1/4-20 | .635 | 3.50 | .500 (12.7) | .081 (2.06) | 4.156 (105.56) | .722 (18.34) | .265 (6.73) |
| 115 | 4 | 5/16-18 | .830 | 4.75 | .500 (12.7) | .237 (6.02) | 4.927 (125.15) | .504 (12.80) | .265 (6.73) |

Bore to Size Data

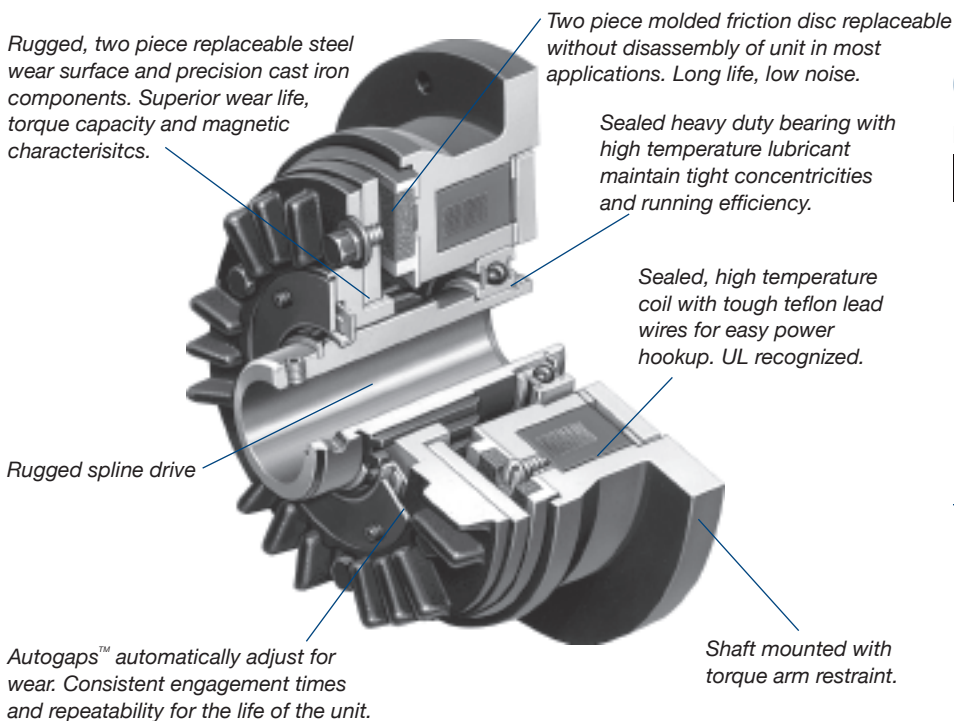
| Model | U Bore Dia. | V Keyway Height | W Keyway Width | X Bolt Circle |
|-------|--------------------------------|--------------------------------|----------------------------|------------------|
| 25 | 2.502/2.500 (63.55/63.50) | 2.601/2.591 (66.06/65.81) | .1905/.1855 (4.84/4.79) | 3.00 (76.20) |
| 55 | 3.002/3.000 (76.25/76.20) | 3.099/3.089 (78.71/78.46) | .1905/.1885 (4.84/4.79) | 3.50 (88.90) |
| 115 | 4.002/4.000 (101.65/101.60) | 4.127/4.117 (104.83/104.57) | .378/.376 (9.60/9.55) | 4.50 (114.30) |

Bore Size and Keyways

| Size | Unit Bore | | Key |
|---------|-----------|-------|----------|
| | (in.) | (mm) | |
| ATC-25 | .5025 | 12.76 | 1/8 Sq. |
| | .5005 | 12.71 | |
| | .6275 | 15.94 | 3/16 Sq. |
| | .6255 | 15.89 | |
| ATC-25 | .7525 | 19.11 | 3/16 Sq. |
| ATC-55 | .7505 | 19.06 | |
| ATC-25 | .8775 | 22.29 | 3/16 Sq. |
| ATC-55 | .8755 | 22.24 | |
| ATC-55 | 1.0025 | 25.46 | 1/4 Sq. |
| ATC-55 | 1.0005 | 25.41 | |
| ATC-55 | 1.1275 | 28.64 | 1/4 Sq. |
| ATC-115 | 1.1255 | 28.59 | |
| ATC-115 | 1.2525 | 31.81 | 1/4 Sq. |
| | 1.2505 | 31.76 | |
| | 1.3775 | 34.99 | 5/16 Sq. |
| | 1.3755 | 34.94 | |
| | 1.5025 | 38.16 | 3/8 Sq. |
| | 1.5005 | 38.11 | |

ATB Series AT Brake

Replaceable Armature Faces Assure Minimum Downtime



Ordering Information

Part Numbers

| Model Size | Bore Size | Voltage DC | Part No. |
|------------|-----------|--------------|--------------|
| ATB-25 | 1/2" | 6 | 5191-170-002 |
| | | 24 | 5191-170-010 |
| | | 90 | 5191-170-003 |
| | 5/8" | 6 | 5191-170-004 |
| | | 24 | 5191-170-011 |
| | | 90 | 5191-170-005 |
| | 3/4" | 6 | 5191-170-006 |
| | | 24 | 5191-170-012 |
| | | 90 | 5191-170-007 |
| ATB-55 | 7/8" | 6 | 5191-170-008 |
| | | 24 | 5191-170-013 |
| | | 90 | 5191-170-009 |
| | 3/4" | 6 | 5192-170-002 |
| | | 24 | 5192-170-010 |
| | | 90 | 5192-170-003 |
| | 7/8" | 6 | 5192-170-004 |
| | | 24 | 5192-170-011 |
| | | 90 | 5192-170-005 |
| 1" | 6 | 5192-170-006 | |
| | 24 | 5192-170-012 | |
| | 90 | 5192-170-007 | |
| ATB-115 | 1-1/8" | 6 | 5192-170-008 |
| | | 24 | 5192-170-013 |
| | | 90 | 5192-170-009 |
| | 1-1/8" | 6 | 5193-170-002 |
| | | 24 | 5193-170-010 |
| | | 90 | 5193-170-003 |
| | 1-1/4" | 6 | 5193-170-004 |
| | | 24 | 5193-170-011 |
| | | 90 | 5193-170-005 |
| 1-3/8" | 6 | 5193-170-006 | |
| | 24 | 5193-170-012 | |
| | 90 | 5193-170-007 | |
| 1-1/2" | 6 | 5193-170-008 | |
| | 24 | 5193-170-013 | |
| | 90 | 5193-170-009 | |

ATB Brakes are completely assembled at the factory and have been specifically designed to match the torque ratings of standard motors, reducers, and other power transmission components. They feature a replaceable friction face, which has been designed to provide superior wear life with reduced engagement noise level wear and consistent torque capacity. Wear surfaces can, in many cases, be replaced without removing the unit from the shaft.

4. Select Control

A simple, built-in AC to DC control is optional for 90 volt AT Brakes.

Complete control information is found in the Controls Section. Selection is by required function.

Selection

1. Determine Model Size

Determine the motor horsepower and shaft speed (in RPM) at the brake location.

The correct size unit is shown at the intersection of HP and shaft speed in the chart below.

2. Determine Bore Size

Select bore size and determine part number for correct size brake from parts lists starting on this page.

3. Select Options

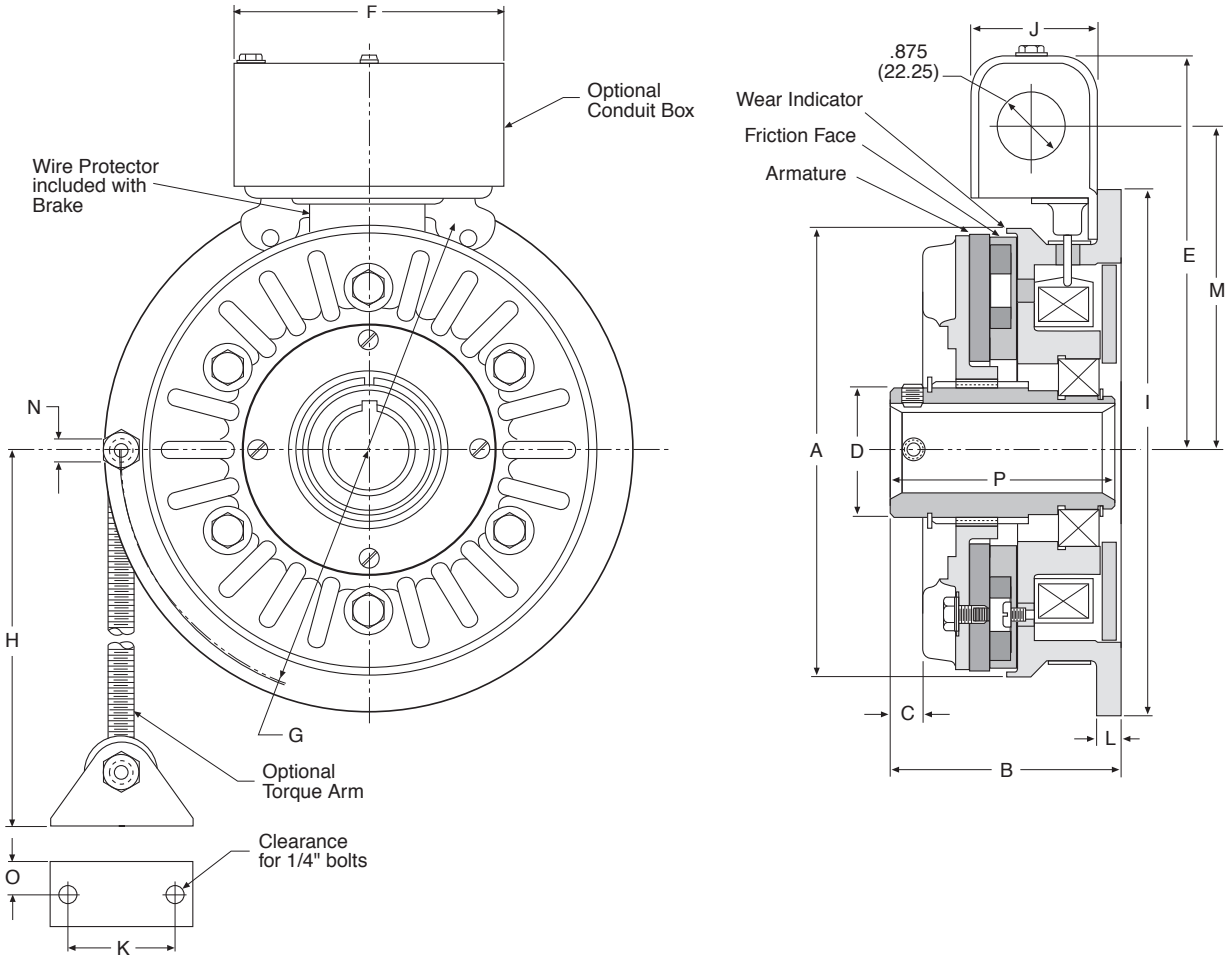
Refer to the Standard Sheaves and Pulley chart to choose an optional Warner Electric standard pulley or obtain information for fitting other pulleys or sprockets.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | | | | | | |

ATB Series AT Brake

ATB-25, ATB-55, ATB-115



Dimensions

All dimensions are nominal, unless otherwise noted.

| Model | A Max. Dia. | B Max. | C Min. Dia. | D Max. | E Nom. | F Max. | G Nom. | H Max. |
|-------|-------------------|-------------------|-------------------|------------------|-------------------|------------------|------------------|-------------------|
| 25 | 4.822 (122.48) | 2.843 (72.21) | .354 (8.99) | 1.345 (34.16) | 4.748 (120.60) | 3.767 (95.68) | 2.406 (61.11) | 9.03 (229.36) |
| 55 | 6.271 (159.28) | 3.224 (91.89) | .281 (7.14) | 1.756 (44.83) | 5.37 (136.40) | 3.767 (95.68) | 3.00 (76.20) | 11.19 (284.23) |
| 115 | 7.906 (200.81) | 4.115 (104.52) | .687 (17.45) | 2.150 (54.61) | 6.278 (159.46) | 3.767 (95.68) | 3.781 (96.04) | 11.19 (284.23) |

| Model | I Max. Dia. | J Nom. | K Min. Nom. | L Max. | M Nom. | N Min. | O Nom. | P Max. |
|-------|-------------------|------------------|-------------------|-----------------|-------------------|----------------|----------------|-------------------|
| 25 | 5.760 (146.30) | 1.544 (39.22) | 1.500 (38.10) | .195 (4.95) | 3.586 (91.08) | .280 (7.11) | .312 (7.92) | 2.765 (70.23) |
| 55 | 7.375 (187.33) | 1.544 (39.22) | 1.50 (38.10) | .491 (12.47) | 4.208 (106.88) | .375 (9.53) | .375 (9.53) | 3.105 (78.87) |
| 115 | 9.00 (228.60) | 1.544 (39.22) | 1.50 (38.10) | .463 (11.76) | 5.116 (129.95) | .375 (9.53) | .375 (9.53) | 3.955 (100.46) |

Bore Sizes and Keyways

| Size | Unit Bore | | Key |
|---------|-----------|---------|----------|
| ATB-25 | .5025 | 12.76 | 1/8 Sq. |
| | .5005 | 12.71 | |
| | .6275 | 15.94 | 3/16 Sq. |
| .6255 | 15.89 | | |
| ATB-25 | .7525 | 19.11 | 3/16 Sq. |
| ATB-55 | .7505 | 19.06 | |
| ATB-25 | .8775 | 22.29 | 3/16 Sq. |
| ATB-55 | .8755 | 22.24 | |
| ATB-55 | 1.0025 | 25.46 | 1/4 Sq. |
| | 1.0005 | 25.41 | |
| ATB-55 | 1.1275 | 28.64 | 1/4 Sq. |
| ATB-115 | 1.1255 | 28.59 | |
| ATB-115 | 1.2525 | 31.81 | 1/4 Sq. |
| | 1.2505 | 31.76 | |
| | 1.3775 | 34.99 | |
| | 1.3755 | 34.94 | 5/16 Sq. |
| | 1.5025 | 38.16 | |
| 1.5005 | 38.11 | 3/8 Sq. | |

Specifications

| Model Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Weight lbs. | Inertia-WR ² lb.-ft. ² | Dynamic Torque @ 1800 RPM |
|------------|-------------|-----------------------|----------|-------------|--|---------------------------|
| 25 | 6, 24 or 90 | 25 | 3600 | 7 | .038 | 12 lb. ft. |
| 55 | 6, 24 or 90 | 55 | 3600 | 15 | .126 | 20 lb. ft. |
| 115 | 6, 24 or 90 | 115 | 3600 | 24 | .383 | 30 lb. ft. |

Shaft Mounted Clutches

Warner Electric's packaged stationary field clutches are factory assembled and burnished to deliver the maximum rated torque immediately. In addition, a packaged product assures that all engineering factors regarding the proper alignment of components to one another have been established at the factory. This allows the unit to be 'slid on the shaft' after being shipped to you. The proper alignment of components is critical to achieving maximum torque and assuring long life.

Features

- No assembly required
- Anti-backlash armatures standard
- Ball bearing mounted field and armature hub
- Four sizes available
 - Size 180 – 15 in. lbs.
 - Size 250 – 70 in. lbs.
 - Size 325 – 125 in. lbs.
 - Size 400 – 270 in. lbs.



No brushes to wear out

Besides saving valuable assembly and run-in time, the SFP clutches incorporate an original Warner Electric concept. The concept of the stationary field eliminates the need for brushes. Brushes can be a high maintenance item in an electromagnetic clutch because of the mechanical friction seen at the collector ring. There is no mechanical friction with the stationary field design. In sum, all of the best possible features wrapped up into one compact package - **Warner Electric's SFP.**

- Packaging equipment
- Film readers
- Conveyors
- Medical equipment
- Sorting/feeding equipment

Functions

- Controlled, soft starts
- Speed variation
- High cycling

Applications

Shaft Mounted Clutches

Specifications

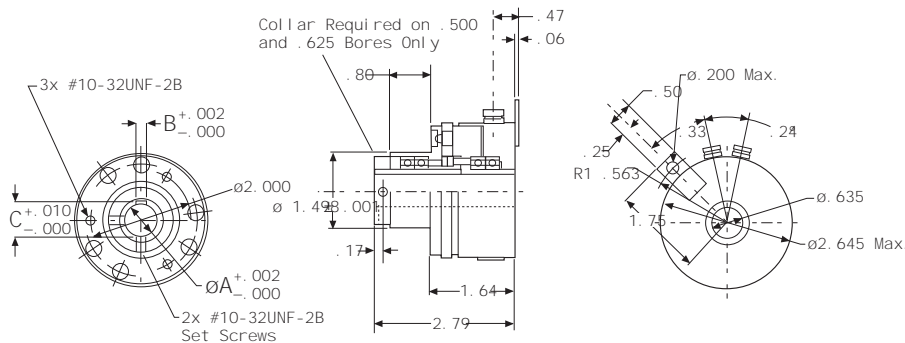
| Model | Static Torque | Max.RPM |
|---------|---------------|---------|
| SFP-180 | 15 in.lb. | 5000 |
| SFP-250 | 70 in.lb. | 7500 |
| SFP-325 | 125 in.lb. | 5000 |
| SFP-400 | 270 in.lb. | 5000 |

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4600 | 5000 |
| 1/50 | | | | | | | | | | | | | | | | | | | | | |
| 1/20 | | | | | | | | | | | | | | | | | | | | | |
| 1/12 | | | | | | | | | | | | | | | 180 | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | 325 | | | | 250 | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | 400 | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |

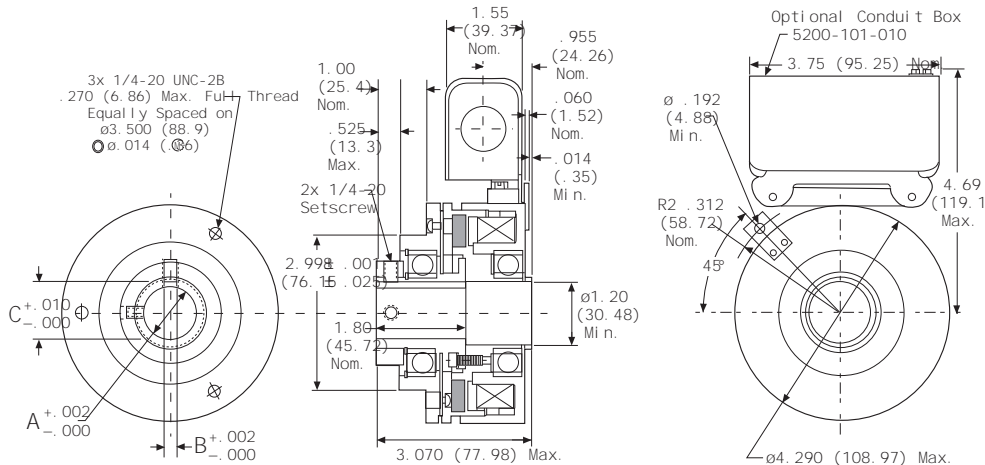
How to Order

1. Select the proper size from the chart (right).
2. Select the bore size and voltage.
3. Find the corresponding part number from the table below.
4. Select a Warner Electric Control if appropriate.

SFP-250



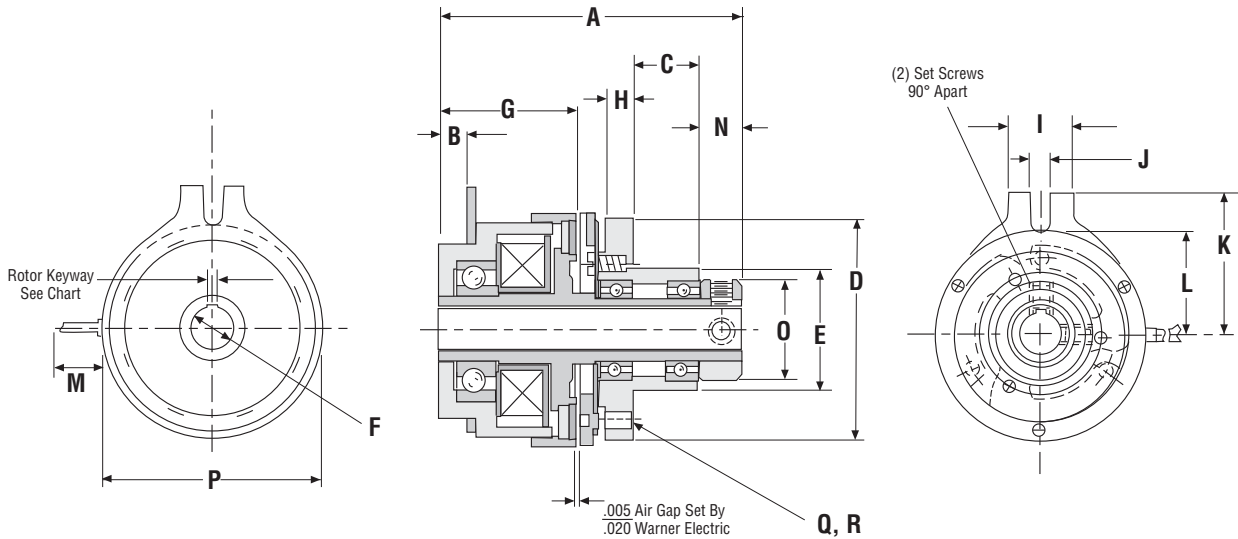
SFP-400



Tolerances

| Model No. | A Bore | Keyway | | Part Number | | |
|-----------|---------|--------|-------|--------------|--------------|--------------|
| | | B | C | 6V | 24V | 90V |
| SFP-250 | .375" | .0948 | .421 | 5103-271-002 | 5103-271-006 | 5103-271-010 |
| | .438" | .126 | .479 | 5103-271-003 | 5103-271-007 | 5103-271-011 |
| | .500" | .126 | .560 | 5103-271-004 | 5103-271-008 | 5103-271-012 |
| | .6255" | .1885 | .678 | 5103-271-005 | 5103-271-009 | 5103-271-013 |
| SFP-400 | .5005" | .125 | .560 | 5104-271-006 | 5104-271-016 | 5104-271-021 |
| | .6255" | .1875 | .709 | 5104-271-007 | 5104-271-017 | 5104-271-022 |
| | .7505" | .1875 | .837 | 5104-271-008 | 5104-271-018 | 5104-271-023 |
| | .8755" | .1875 | .964 | 5104-271-009 | 5104-271-019 | 5104-271-024 |
| | 1.0005" | .1875 | 1.090 | 5104-271-010 | 5104-271-020 | 5104-271-025 |

Pre-Assembled SF Clutch For Parallel Shafts Model 180



Dimensions

| Model No. | A Max. | B Max. | C Nom. | D Max. | E ± .001 | F Nom. | G Nom. | H Nom. | I Max. | J Min. | K Nom. | L Nom. | M ± .500 | N Nom. | O Nom. | P Max. | Rotor Keyway | | | |
|-----------|--------|--------|--------|--------|----------|--|--------|--------|--------|--------|--------|--------|----------|--------|--------|--------|--------------|-----------------|------------------|----------------|
| | | | | | | | | | | | | | | | | | Bore | Nominal Keyway | Q B.C. | R SIZE |
| 180 | 2.515 | .304 | .500 | 1.755 | .9985 | $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ | 1.290 | .193 | .505 | .184 | 1.325 | .975 | 12.00 | .315 | .875 | 1.620 | N.A. | SET SCREWS ONLY | 1.437 3-Holes | 8-32 UNC-2B |

Mechanical

| Model No. | Static Torque lb. - in. | Inertia lb. - in. ² | | Wt. oz. |
|-----------|-------------------------|--------------------------------|-----------|---------|
| | | Rotor | Arm & Hub | |
| 180 | 15 | .052 | .095 | 26 |

Electrical

| Model No. | 90 VDC | | 24 VDC | |
|-----------|--------|------|--------|------|
| | Amps | Ohms | Amps | Ohms |
| 180 | .066 | 1369 | .289 | 83.1 |

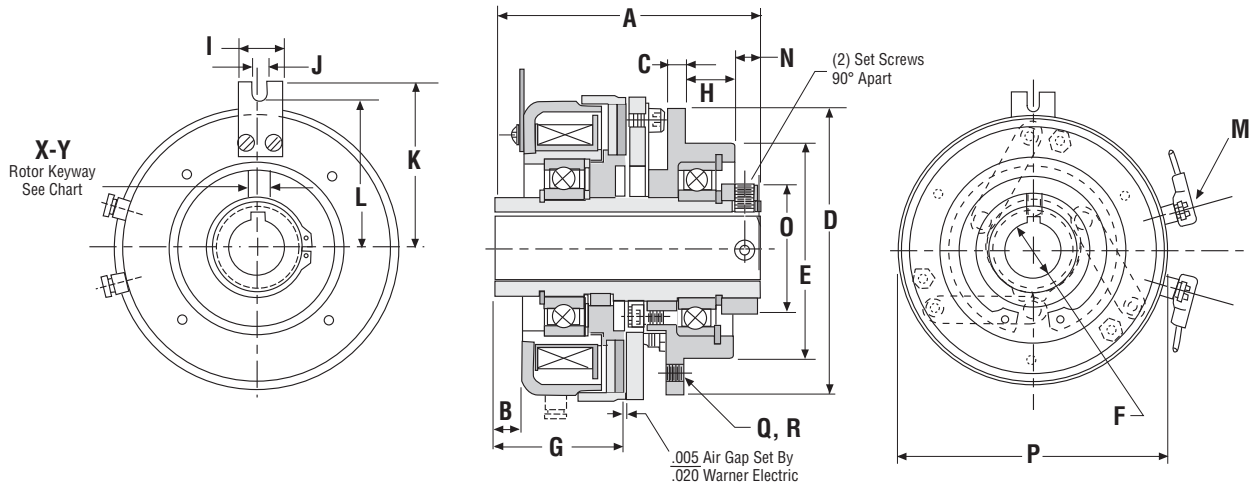
Part Numbers

| Model Size | Bore Size | Voltage DC | Part No. |
|------------|-----------|------------|---------------|
| 180 | 1/4" | 24 | SFP180-14-24 |
| | 5/16" | 24 | SFP180-516-24 |
| | 3/8" | 24 | SFP180-38-24 |
| | 1/4" | 90 | SFP180-14-90 |
| | 5/16" | 90 | SFP180-516-90 |
| | 3/8" | 90 | SFP180-38-90 |

Customer shall maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.

Pre-Assembled SF Clutch For Parallel Shafts
Model 325



Dimensions

| Model No. | A Max. | B Max. | C Nom. | D Max. | E ±.001 | F Nom. | G Nom. | H Nom. | I Max. | J Min. | K Nom. | L Nom. | M ±.500 | N Nom. | O Nom. | P Max. | Rotor Keyway | | Q B.C. | R SIZE | |
|-----------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|-----------------|--------|--------|--------|-------------------|-------------|-------------|---------------|-------------|
| | | | | | | | | | | | | | | | | | Nominal Keyway X* | Y* | | | |
| 325 | 2.961 | .140 | .395 | 2.883 | 1.498 | 1/2 | 1.360 | .500 | .442 | .170 | 2.050 | 1.740 | Screw Terminals | .408 | 1.187 | 3.300 | 1/2 | .125 - .128 | .560 - .567 | 1.790 3-Holes | 6-32 UNC-2B |

*7/8 and 1 inch bore in rotor only.

Mechanical

| Model No. | Static Torque lb. - in. | Inertia lb. - in. ² | | Wt. oz. |
|-----------|-------------------------|--------------------------------|-----------|---------|
| | | Rotor | Arm & Hub | |
| 325 | 125 | .560 | .990 | 54 |

Electrical

| Model No. | 90 VDC | | 24 VDC | |
|-----------|--------|------|--------|------|
| | Amps | Ohms | Amps | Ohms |
| 325 | .091 | 988 | .378 | 65.3 |

Lead wire is UL recognized style 1213, 1015 or 1430, 22 gage. Insulation is .0509 O.D. on 110 units; .0649 or .0959 O.D. on all other units.

Part Numbers

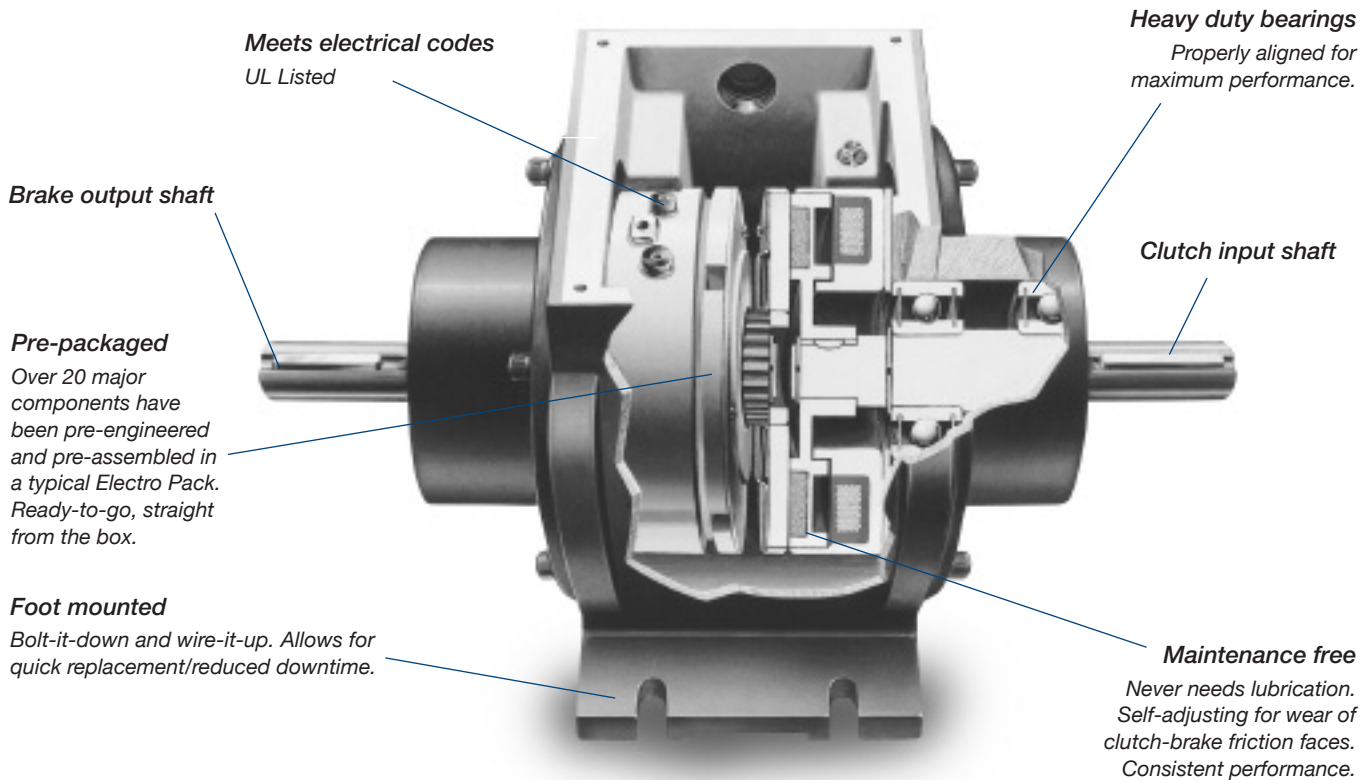
| Model Size | Bore Size | Voltage DC | Part No. |
|------------|-----------|------------|--------------|
| 325 | 1/2" | 24 | SFP325-12-24 |
| | 1/2" | 90 | SFP325-12-90 |

Customer shall maintain:

A loose-fitting pin through the anti-rotation tab to prevent preloading the bearings.

EP Series Electro Pack

Base Mounted Clutch/Brake Combinations in a Rugged Housing



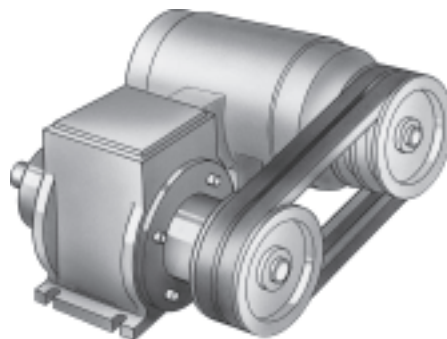
Electro Packs are rugged, pre-assembled clutch and brake combinations in an enclosed, foot mounted housing.

They are factory aligned and pre-assembled and have been designed to mate easily with industry standard motors and reducers with v-belts, pulleys, chain and sprockets, in line couplings and timing belt drives.

Features

- Bolt-it-down and wire-it-up . . . it's ready to go!
- Maintenance free
- A wide torque range from 15 lb. in. to 1350 lb. ft.

Typical Application



A foot mounted Electro Pack combines with a motor in a parallel shaft drive application.

Selection/Ordering Information

Horsepower vs. Shaft Speed

| HP ▼ | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | | | | |
|---------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 | 5000 | |
| 1/50 | | | | | | | | | | | | | | | | | | | | | | |
| 1/20 | | | | | | | | | | | | | | | | | | | | | | |
| 1/12 | | | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | | | | | | | | |

Selection Procedure

Determine the shaft speed at the Electro Pack location. The number listed at the intersection of horsepower and speed is the size Electro Pack you require.

Part Numbers

| Model No. | Voltage DC | Part No. |
|-----------|------------|--------------|
| EP-170 | 6 | 5633-273-002 |
| | 24 | 5633-273-003 |
| | 90 | 5633-273-005 |
| EP-250 | 6 | 5130-273-031 |
| | 24 | 5130-273-032 |
| | 90 | 5130-273-034 |
| EP-400 | 6 | 5131-273-009 |
| | 24 | 5131-273-010 |
| | 90 | 5131-273-011 |
| EP-500 | 6 | 5230-273-003 |
| | 24 | 5230-273-011 |
| | 90 | 5230-273-002 |
| EP-825 | 6 | 5231-273-003 |
| | 24 | 5231-273-004 |
| | 90 | 5231-273-002 |
| EP-1000 | 6 | 5232-273-003 |
| | 24 | 5232-273-005 |
| | 90 | 5232-273-002 |
| EP-1525 | 6 | 5234-273-003 |
| | 90 | 5234-273-002 |
| EP-1525HT | 24 | 5234-273-017 |
| | 90 | 5234-273-012 |

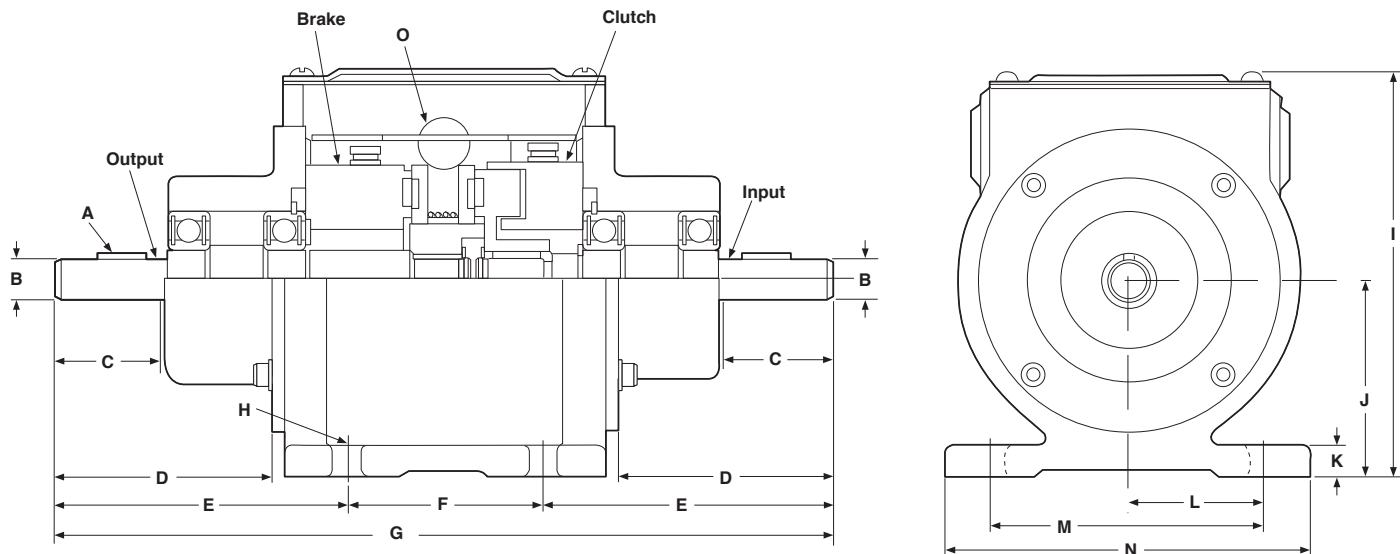
When ordering, specify size, voltage, and part numbers.

Specifications

| Electro-Pack Size | Horsepower @ 1800 RPM | Static Torque | Max. RPM | Voltage DC |
|-------------------|-----------------------|--|----------|-------------|
| EP-170 | 1/8 | 15 lb. in. | 10,000 | 6, 24 or 90 |
| EP-250 | 1/2 | 70 lb. in. | 7,500 | 6, 24 or 90 |
| EP-400 | 1 | 270 lb. in. | 4,500 | 6, 24 or 90 |
| EP-500 | 2 | 50/40 lb. ft. | 4,000 | 6, 24 or 90 |
| EP-825 | 7-1/2 | 125 lb. ft. | 3,600 | 6, 24 or 90 |
| EP-1000 | 10 | 240 lb. ft. | 3,000 | 6, 24 or 90 |
| EP-1525 | 25 | 700 lb. ft. | 1,800 | 6 or 90 |
| EP-1525HT | 40 | 1350 lb. ft. clutch 700 lb. ft. brake | 1,800 | 24, 90 |

EP Series Electro Pack

EP-170, EP-250, EP-400



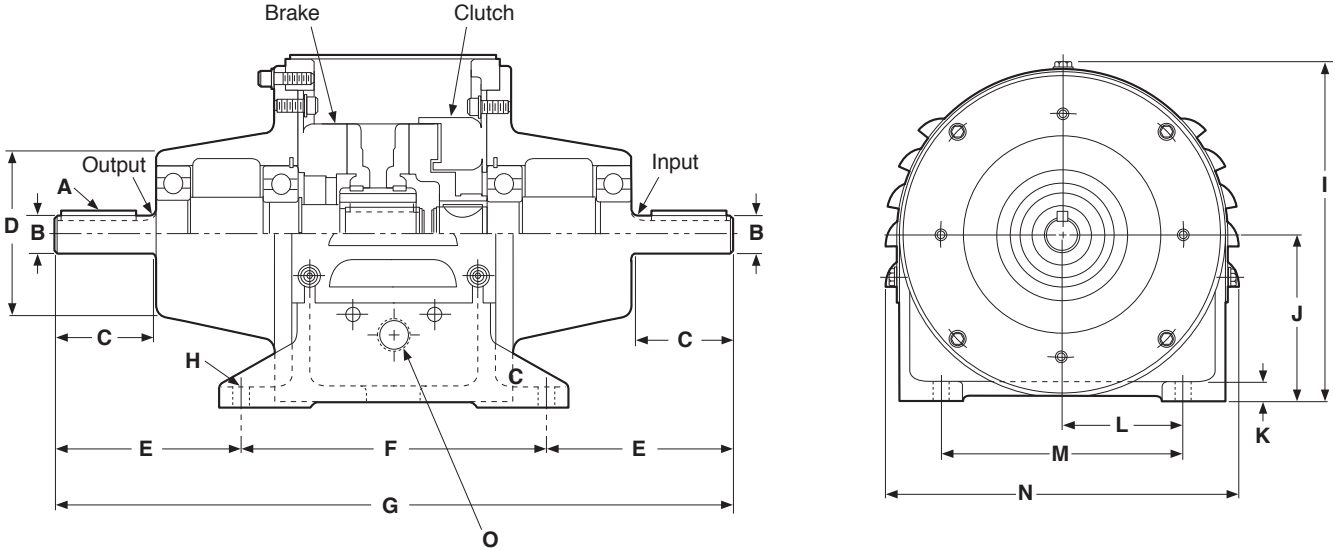
Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A | B | C Min. | D | E | F | G Max. | H | I | J | K | L | M | N | O |
|------|---------------------------|------------------------|--------|-------|-------|-------|--------|------------------------|-------|----------------|------|-------|-------|-------|---------------------------|
| 170 | 3/32 x 3/64 | .3745 .3735 Dia. | .750 | 1.406 | 2.203 | 1.500 | 6.000 | .250 Wide (4 slots) | 3.437 | 1.662 1.652 | .312 | 1.110 | 2.220 | 3.250 | 1/2 14 NPT Conduit x 2 |
| 250 | 1/8 x 1/16 | .4995 .4985 Dia. | 1.250 | 2.468 | 3.312 | 2.250 | 8.968 | .312 Wide (4 slots) | 5.281 | 2.318 2.308 | .375 | 1.625 | 3.250 | 4.250 | 1/2 14 NPT Conduit x 2 |
| 400 | 3/16 x 3/16 x 1-1/2 | .7495 .7485 Dia. | 1.875 | 3.515 | 4.593 | 2.500 | 11.781 | .312 Wide (4 slots) | 6.937 | 3.474 3.464 | .500 | 2.578 | 5.156 | 6.000 | 1/2 14 NPT Conduit x 2 |

Specifications

| Model Size | Voltage DC | Static Torque lb. in. | Inertia*—WR ² (lb-in ²) | | Max. RPM | Weight lbs. |
|------------|------------|-----------------------|--|-------|----------|-------------|
| | | | Output | Input | | |
| EP-170 | 6 | 15 | .031 | .036 | 10,000 | 2.5 |
| | 24 | 15 | .031 | .036 | 10,000 | 2.5 |
| | 90 | 15 | .031 | .036 | 10,000 | 2.5 |
| EP-250 | 6 | 70 | .331 | .293 | 7,500 | 7.1 |
| | 24 | 70 | .331 | .293 | 7,500 | 7.1 |
| | 90 | 70 | .331 | .293 | 7,500 | 7.1 |
| EP-400 | 6 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |
| | 24 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |
| | 90 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |



Dimensions

All dimensions are nominal, unless otherwise noted.

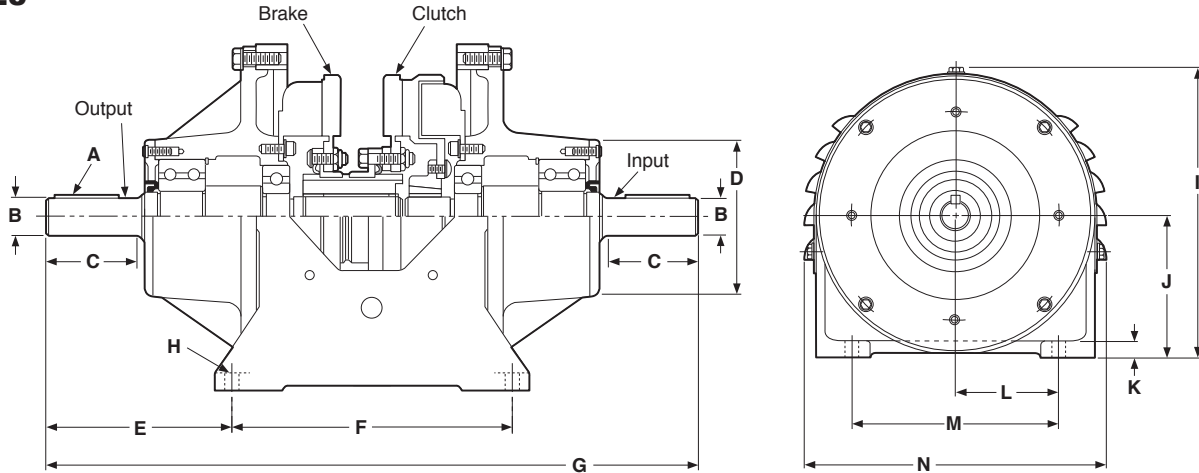
| Size | A | B Dia. | C Min. | D Max. Dia. | E | F | G Max. | H Dia. | I | J | K | L | M | N Max. | O |
|------|--------------|--------|--------|-------------|-------|-------|--------|----------------|-------|-------|------|-------|-------|--------|---------------------|
| 500 | 3/16 x 1-3/4 | .8750 | 2.218 | 3.796 | 4.234 | 7.000 | 15.515 | .406 (4 holes) | 8.218 | 4.004 | .500 | 2.937 | 5.875 | 8.734 | 1/2 NPT Conduit x 2 |

Specifications

| Model Size | Voltage DC | Unit | Static Torque | Inertia*—WR ² lb.ft. ² | Max. RPM | Weight lbs. |
|------------|--------------|-----------------|---------------|--|----------|-------------|
| EP-500 | 6, 24 and 90 | Clutch Brake | 50 40 | .039 .063 | 4000 | 56 |

EP Series Electro Pack

EP-825



Dimensions

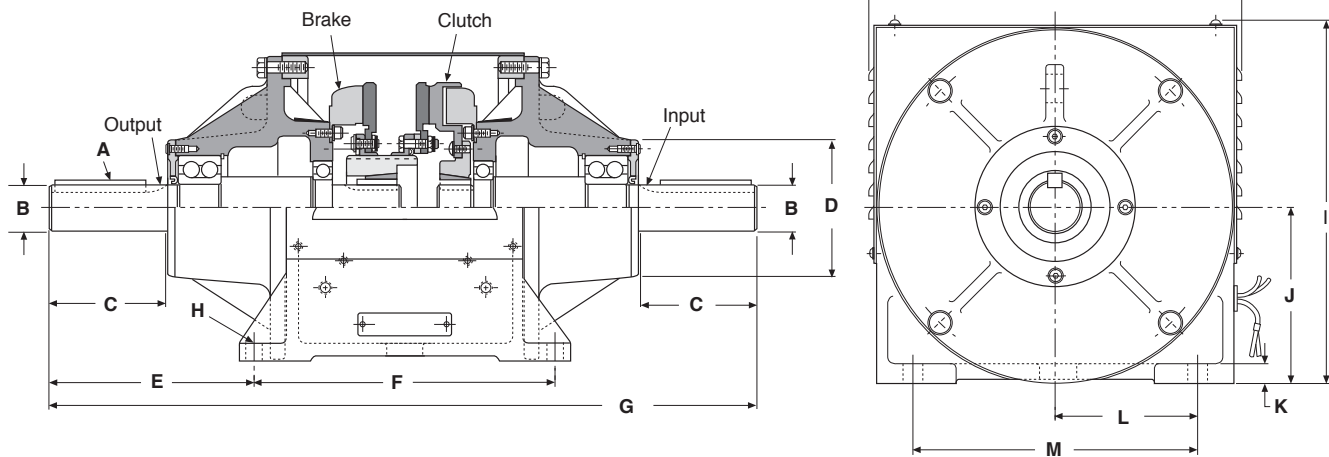
All dimensions are nominal, unless otherwise noted.

| Size | A | B Dia. | C Min. | D Max. Dia. | E | F | G Max. | H | I | J | K | L | M | N Max. |
|------|------------------|------------------|--------|-------------|-------|-------|--------|------------------------|--------|----------------|------|-------|-------|--------|
| 825 | 1/4 x 1/4 x 2 | 1.1250 1.1245 | 2.875 | 5.000 | 5.734 | 8.500 | 20.031 | .406 Dia. (4 holes) | 10.812 | 5.254 5.252 | .562 | 4.250 | 8.500 | 11.609 |

Specifications EP-825

| Model Size | Voltage DC | Unit | Static Torque | Inertia*—WR ² lb.ft.2 | Max. RPM | Weight lbs. |
|------------|------------|-----------------|---------------|----------------------------------|----------|-------------|
| EP-825 | 6, 24 & 90 | Clutch Brake | 125 125 | .651 .242 | 3600 | 123 |

EP-1000



Dimensions

All dimensions are nominal, unless otherwise noted.

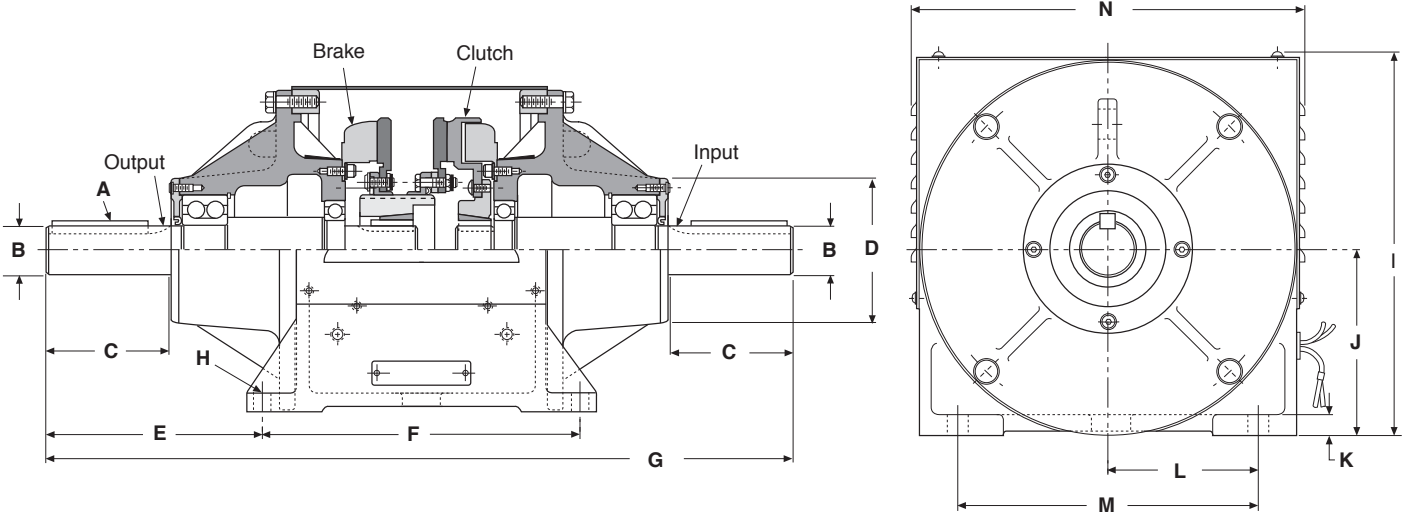
| Size | A | B Dia. | C Min. | D Dia. | E | F | G Max. | H | I | J | K | L | M | N Max. |
|------|-------------------------|----------------|--------|--------|-------|--------|--------|------------------------|--------|----------------|------|-------|--------|--------|
| 1000 | 1/2 x 1/2 x 3-3/4 | 1.875 1.874 | 4.750 | 5.687 | 8.250 | 12.250 | 28.750 | .656 Dia. (4 holes) | 12.500 | 6.255 6.241 | .718 | 5.000 | 10.000 | 12.875 |

Specifications EP-1000

| Model Size | Voltage DC | Static Torque | Inertia*—WR ² (lb-ft ²) | | Max. RPM | Weight lbs. |
|------------|------------|---------------|--|------------|----------|-------------|
| | | | Output Side | Input Side | | |
| EP-1000 | 6 | 240 lb.ft. | 1.45 | 1.01 | 3000 | 288 |
| | 24 | 240 lb.ft. | 1.45 | 1.01 | 3000 | 288 |
| | 90 | 240 lb.ft. | 1.45 | 1.01 | 3000 | 288 |

EP Series Electro Pack

EP-1525, EP-1525HT



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A | B Dia. | C Min. | D Max. Dia. | E | F | G Max. | H | I | J | K | L | M | N Max. |
|--------|----------------|--------|--------|-------------|-------|--------|--------|------------------------|--------|-------|-------|-------|--------|--------|
| 1525 | 5/8 x | 2.375 | 5.750 | 7.500 | 8.468 | 16.500 | 33.500 | .796 Dia. (4 holes) | 18.250 | 9.005 | 1.000 | 7.000 | 14.000 | 18.875 |
| | 5/8 x 4-1/4 | 2.374 | | | | | | | | 8.991 | | | | |
| 1525HT | 5/8 x | 2.375 | 5.750 | 7.500 | 8.468 | 16.500 | 33.500 | .796 Dia. (4 holes) | 18.250 | 9.005 | 1.000 | 7.000 | 14.000 | 18.875 |
| | 5/8 x 4-1/4 | 2.374 | | | | | | | | 8.991 | | | | |

Specifications

| Model Size | Voltage DC | Unit | Static Torque lb.ft. | Inertia* - WR ² lb.ft. ² | | Max. RPM | Weight lbs. |
|------------|------------|--------|----------------------|--|-------|----------|-------------|
| | | | | Output | Input | | |
| EP-1525 | 6, 90 | Clutch | 700 | 7.89 | 5.68 | 1800 | 655 |
| | | Brake | 700 | | | | |
| EP-1525HT | 24, 90 | Clutch | 1350 | 7.89 | 6.41 | 1800 | 656 |
| | | Brake | 700 | | | | |

EP-C Series Electro Pack – Ceramic Faced

PerformancePlus™ clutch/brake combination in a foot mounted housing

Single point wire exit

Pre-packaged

Major components have been pre-engineered and pre-assembled in a typical Electro Pack. Ready-to-go, straight from the box.

Heavy duty bearings

Properly aligned for maximum performance.

Ceramic on ceramic friction system

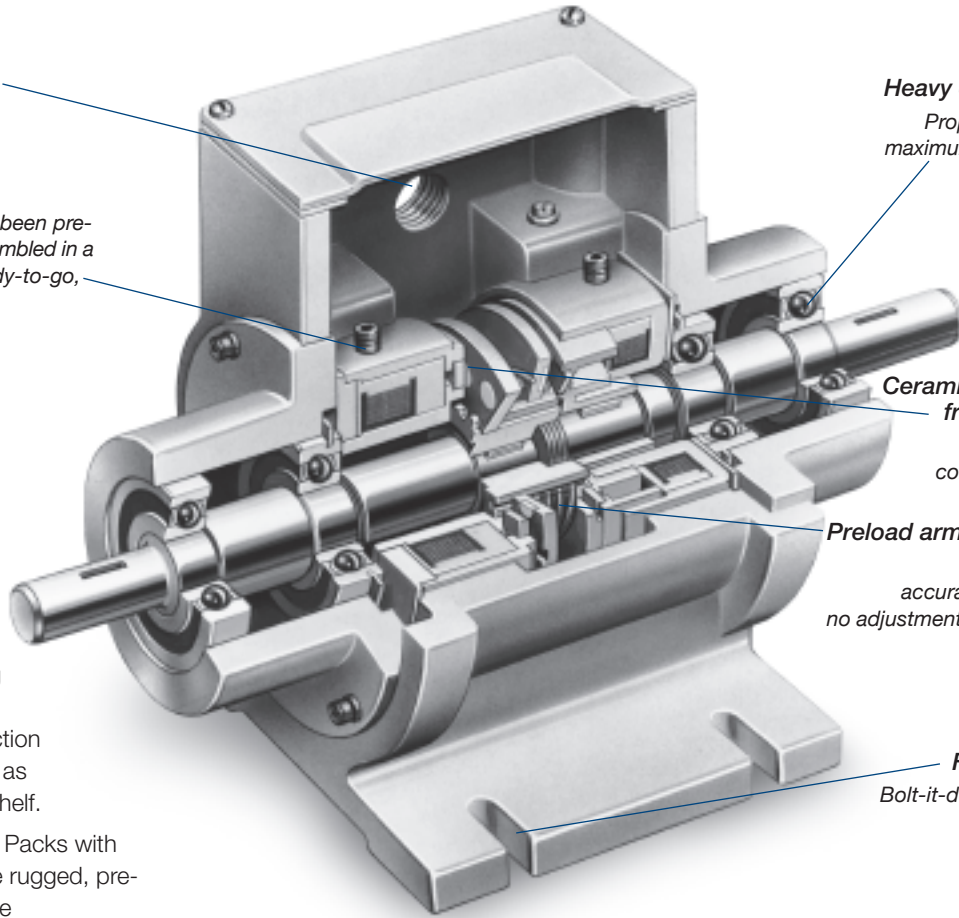
Longer life, and consistent torque.

Preload armature springs

Fast response, accurate repeatability, no adjustments for life of unit.

Foot mounted

Bolt-it-down, wire-it-up.



PerformancePlus™ Electro Packs use ceramic friction system technology. This technology has been in use for many years in specialized applications. Through the development of advanced manufacturing techniques, the improved performance of ceramic friction materials are now available as standard products off the shelf.

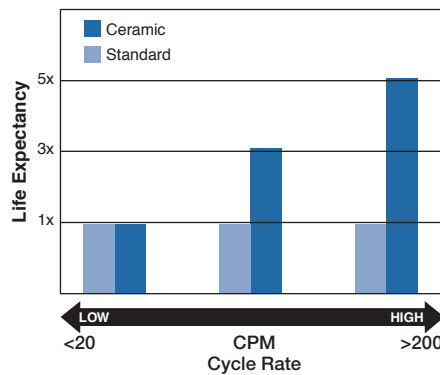
PerformancePlus™ Electro Packs with ceramic friction material are rugged, pre-assembled clutch and brake combinations in base mounted housings. They have been designed to be installed in standard power transmission systems with V-belts and pulleys, chain and sprockets, in line couplings, and timing belt drives.

When your application calls for a long life clutch/brake because of high cycle rates or demanding consistency, choose the PerformancePlus solution.

- Bolt-it-down and wire-it-up . . . it's ready to go!
- Available in two size; 170 and 250. Standard voltages are 24V and 90V DC.
- Maintenance free.
- Ideal for use with CBC 1000 indexers and CBC 700 OEX control.

PerformancePlus™ . . . the demanding application choice.

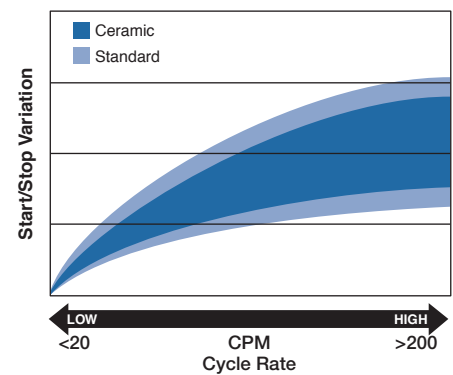
EP-C Product Life



Extended Life for High Cycle Rate Use

Ceramic faced clutches and brakes have been designed specifically for rapid cycling applications to satisfy today's needs for high speed equipment. Ceramic friction material provides excellent wear resistance that extends life 3 to 5 times that of standard clutch/brakes in demanding applications.

EP-C Cycle Repeat



Consistent Torque and Cycle Repeatability

Preloaded armatures keep the ceramic friction surfaces in light contact, providing consistent torque and cycle-to-cycle repeatability. Variation is reduced by up to 30% over standard units.

EP-C Series Electro Pack – Ceramic Faced

Applications/Selection

Controllability Smooth Start/Stop

With the ceramic friction surfaces always in contact, dynamic torque response is fast and precise. When used with a CBC-700 over-excitation control and CBC-1000 programmable counter, exceptional closed loop clutch/brake performance can be achieved approaching that of more expensive motion control technologies – The PerformancePlus difference!

Selection

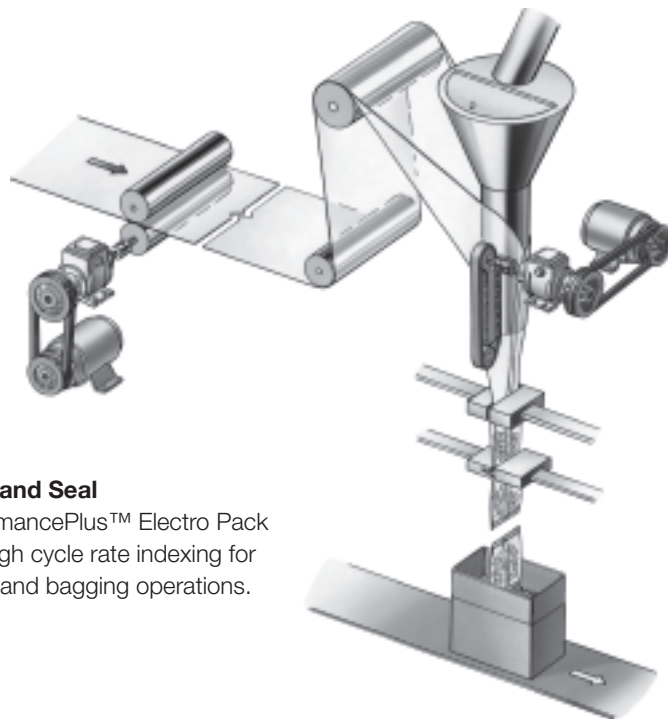
PerformancePlus Electro Packs are best suited for high energy applications where long life is a premium concern. The harder a ceramic friction surface is worked, the more wear life benefit is achieved. For slower cycle rates, up to 75 cycles per minute, dependable standard clutch/brakes are still a good choice.

For high cycle rates and high energy use (generally more than 50 cycles/minute for EP-170's and EP-250's) PerformancePlus clutch/brakes are the choice.

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation. Over temperature use will have an adverse effect on bearing life and coil wire insulation integrity.

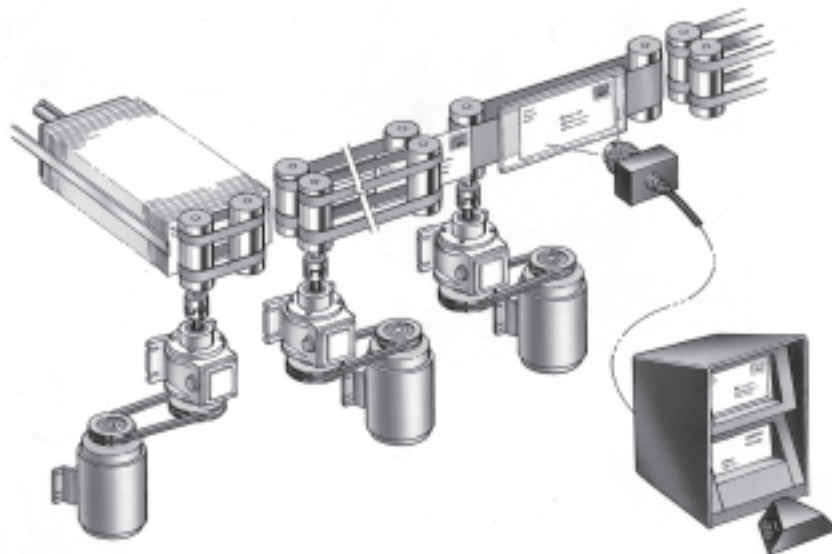
For proper sizing information, refer to the Horsepower vs. Shaft Speed chart, and the technical sizing considerations below. When ordering, specify size, voltage, and part number.

Typical Applications



Form, Fill and Seal

The PerformancePlus™ Electro Pack provides high cycle rate indexing for packaging and bagging operations.



Mail Processing

The PerformancePlus Electro Pack provides fast cycling and accurate starting and stopping.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | | | |
|------|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4600 | 5000 |
| 1/50 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/20 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/12 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/8 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/6 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/4 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/3 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1/2 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |
| 1 | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded | Shaded |

EP-C Series Electro Pack – Ceramic Faced

Selection/Ordering Information

Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application.

Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

These curves show the heat dissipation capability of the ceramic units.

Heat dissipation requirement is calculated as follows:

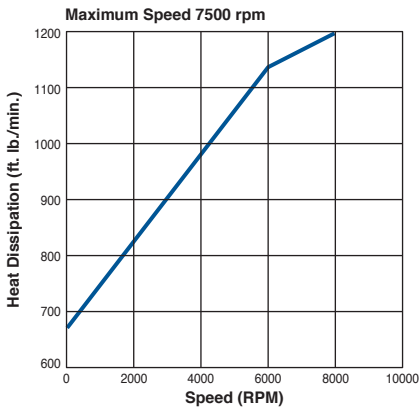
$$E = 1.7 \times WR^2 \times \left(\frac{N}{100}\right)^2 \times F$$

where:

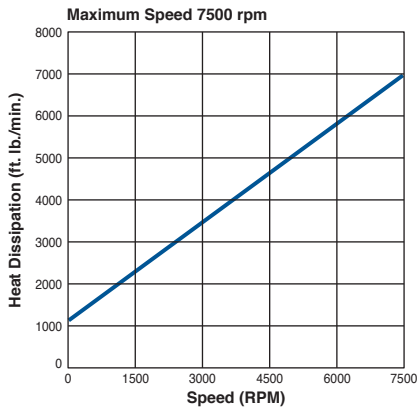
- E = Heat (lb.ft./min.)
- WR² = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)
- N = Speed in revolutions per minute. (RPM)
- F = Cycle rate in cycles per minute. (CPM)

Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

EP-170-C



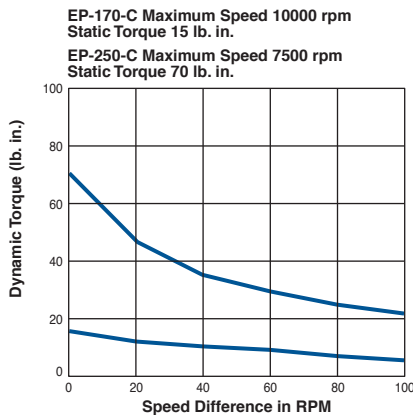
EP-250-C



Dynamic Torque Sizing

These curves show the average dynamic torque during the slip period of engagement. Find the dynamic torque value on the curve at the clutch/brake input speed.

EP-170-C EP-250-C



For most applications, the correct size clutch/brake can be selected from the horsepower/shaft speed selection chart. Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the technical ratings chart to select a unit.

Torque Ratings

| Model Size | Max. RPM | Static Torque | Voltage DC |
|------------|----------|---------------|------------|
| EP-170-C | 10,000 | 15 lb. in. | 24 & 90 |
| EP-250-C | 7500 | 70 lb. in. | 24 & 90 |

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = \frac{WR^2 \times N}{308 \times t}$$

where:

- T = Average Dynamic Torque (lb. ft.) (For EP selection, multiply by 12 to convert to units of lb. in.)
- WR² = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)
- N = Speed in revolutions per minute. (RPM)
- t = Time allowed for the engagement (sec)

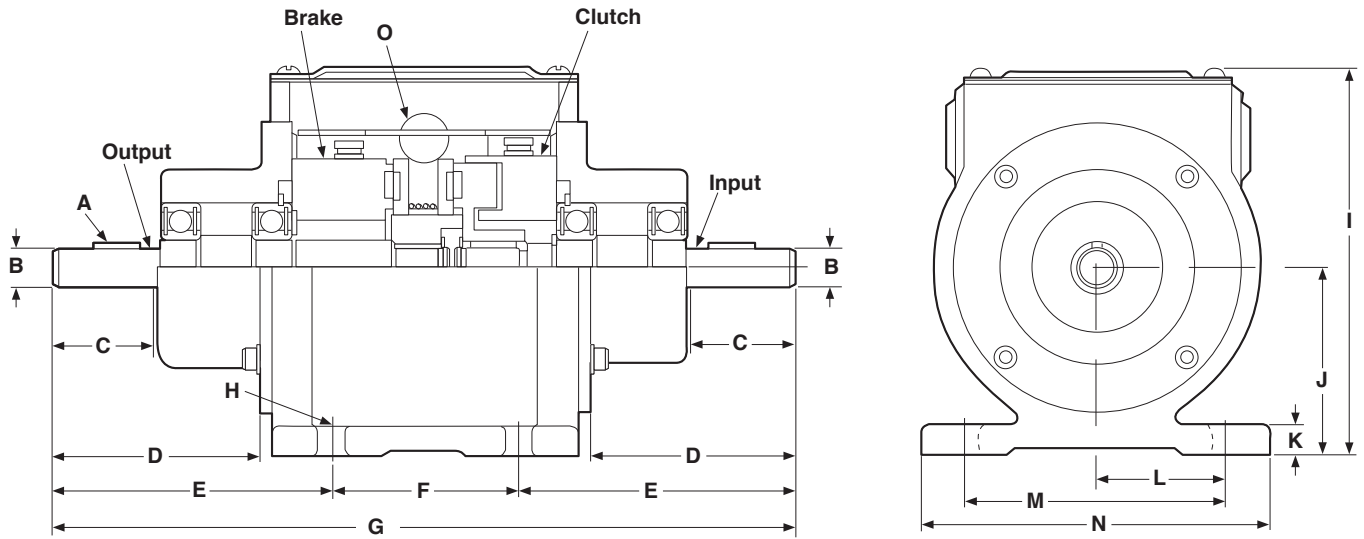
Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger unit size.

Part Numbers

| Model Size | Voltage DC | Part No. |
|------------|------------|--------------|
| EP-170-C | 24V | 5633-273-018 |
| | 90V | 5633-273-019 |
| EP-250-C | 24V | 5130-273-053 |
| | 90V | 5130-273-054 |

EP-C Series Electro Pack – Ceramic Faced

EP-170-C, EP-250-C



All dimensions are nominal, unless otherwise noted.

| Size | A | B Dia. | C Min. | D | E | F | G Max. | H | I | J | K | L | M | N | O |
|-------|----------------|----------------|--------|-------|-------|-------|--------|------------------------|-------|----------------|------|-------|-------|-------|-----------------------|
| 170-C | 3/32 x 3/64 | .3745 .3735 | .750 | 1.406 | 2.203 | 1.500 | 6.000 | .250 Wide (4 slots) | 3.437 | 1.662 1.652 | .312 | 1.125 | 2.250 | 3.250 | 14 NPT 1/2 conduit |
| 250-C | 1/8 x 1/16 | .4995 .4985 | 1.230 | 2.468 | 3.312 | 2.250 | 8.968 | .312 Wide (4 slots) | 5.281 | 2.318 2.308 | .375 | 1.625 | 3.250 | 4.250 | 14 NPT 1/2 conduit |

Specifications

| Model Size | Voltage DC | Unit | Static Torque lb. in. | Inertia* -WR ² lb.ft. ² | | Max. RPM | Weight lbs. |
|------------|------------|--------|-----------------------|---|-------|----------|-------------|
| | | | | Output | Input | | |
| 170-C | 24 | Clutch | 15 | .031 | .036 | 10,000 | 2.8 |
| | | Brake | 15 | .031 | .036 | 10,000 | 2.8 |
| 170-C | 90 | Clutch | 15 | .031 | .036 | 10,000 | 2.8 |
| | | Brake | 15 | .031 | .036 | 10,000 | 2.8 |
| 250-C | 24 | Clutch | 70 | .331 | .293 | 7,500 | 7.5 |
| | | Brake | 70 | .331 | .293 | 7,500 | 7.5 |
| 250-C | 90 | Clutch | 70 | .331 | .293 | 7,500 | 7.5 |
| | | Brake | 70 | .331 | .293 | 7,500 | 7.5 |

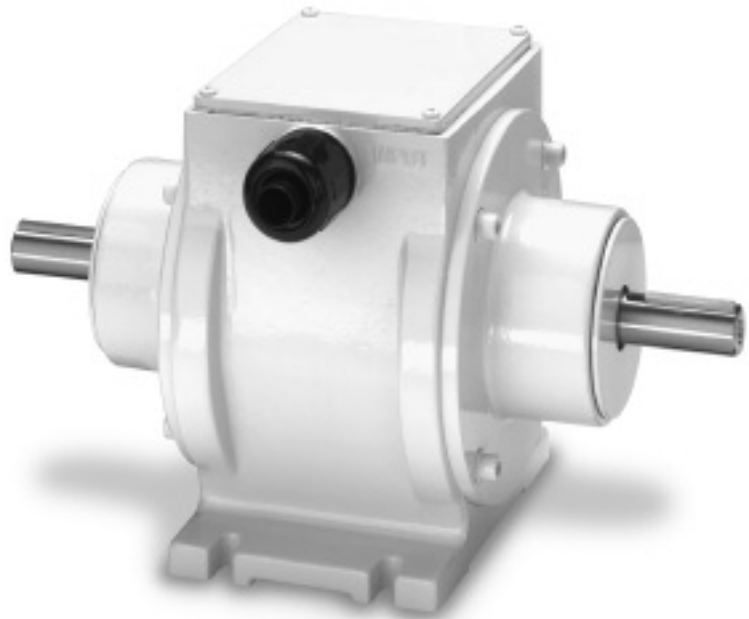
Washdown Electro Pack

If your clutch/brake application demands consistent, repeatable performance cycle after cycle, through wet and dry conditions, choose Warner Electric's Washdown Electro Pack Clutch/Brakes.

Even in the most demanding environments, Washdown Electro Pack Clutch/Brakes (EP-W) will weather the storm. Designed specifically for use in food, sanitary or any other washdown application, these packaged clutch/brakes are totally enclosed in smooth, completely sealed, rugged enclosures to keep wear particles in and contaminants out.

Washdown Electro Packs are factory aligned, assembled and burnished for consistent out-of-the-box performance.

- USDA Approved coating
- Smooth exterior
- Shielded/sealed bearings
- Available in 70 and 270 lb-in Static torque configurations
- Available in 24 and 90 vdc



Horsepower vs. Shaft Speed

| HP ▼ | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | | | |
|---------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 | 5000 |
| 1/50 | | | | | | | | | | | | | | | | | | | | | |
| 1/20 | | | | | | | | | | | | | | | | | | | | | |
| 1/12 | | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |

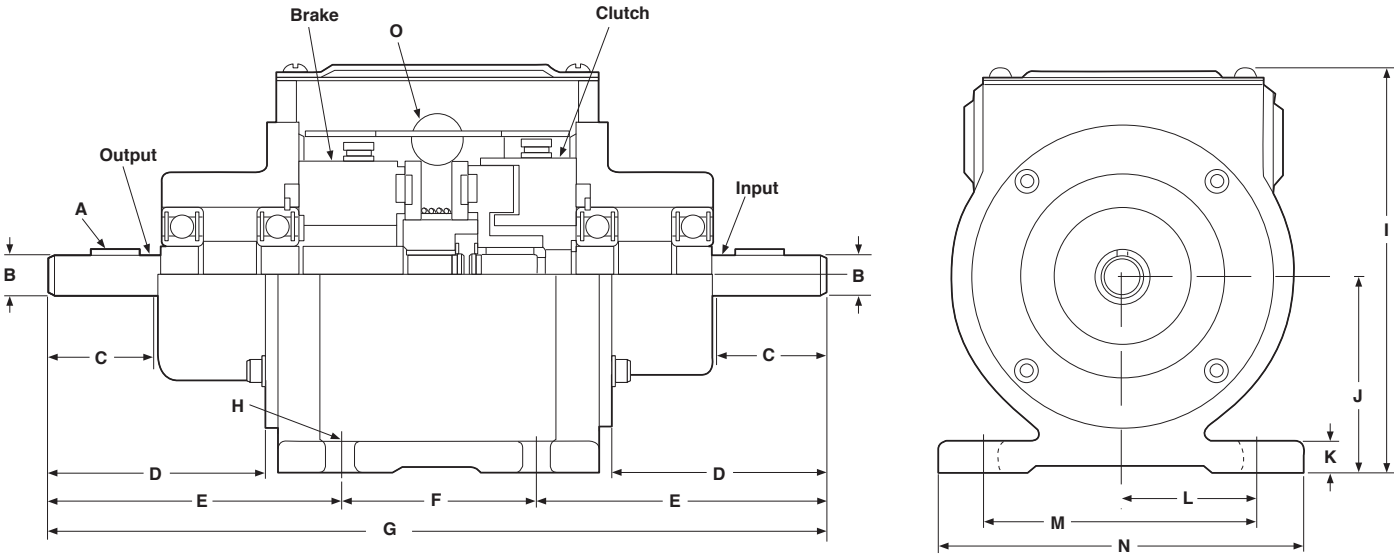
Washdown Electro Pack Clutch/Brakes

Warner Electric's new Washdown Electro Packs are currently available in two sizes, and in 24 and 90 volt configurations. If your application requires a different voltage or mounting configuration, please contact Warner Electric for assistance.

| Model | Voltage (DC) | | Static Torque (lb-in) | Part Number |
|----------|--------------|------|-----------------------|--------------|
| | Max RPM | | | |
| EP-250-W | 24 | 7500 | 70 | 5130-273-060 |
| | 90 | | | 5130-273-061 |
| EP-400-W | 24 | 4500 | 270 | 5131-273-030 |
| | 90 | | | 5131-273-031 |

Washdown Electro Pack

EP-250 and EP-400



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A | B | C Min. | D | E | F | G Max. | H | I | J | K | L | M | N | O |
|------|-----------------|---------------|--------|-------|-------|-------|--------|------------------------|-------|-------|------|-------|-------|-------|---------------------------|
| 250 | 1/8 x | .4995 | 1.250 | 2.468 | 3.312 | 2.250 | 8.968 | .312 Wide (4 slots) | 5.281 | 2.318 | .375 | 1.625 | 3.250 | 4.250 | 1/2 14 NPT Conduit x 2 |
| | 1/16 | .4985 Dia. | | | | | | | | 2.308 | | | | | |
| 400 | 3/16 x | .7495 | 1.875 | 3.515 | 4.593 | 2.500 | 11.781 | .312 Wide (4 slots) | 6.937 | 3.474 | .500 | 2.578 | 5.156 | 6.000 | 1/2 14 NPT Conduit x 2 |
| | 3/16 x 1-1/2 | .7485 Dia. | | | | | | | | 3.464 | | | | | |

Specifications

| Model Size | Voltage DC | Static Torque lb. in. | Inertia*—WR ² (lb-in ²) | | Max. RPM | Weight lbs. |
|------------|------------|-----------------------|--|-------|----------|-------------|
| | | | Output | Input | | |
| EP-250-W | 6 | 70 | .331 | .293 | 7,500 | 7.1 |
| | 24 | 70 | .331 | .293 | 7,500 | 7.1 |
| | 90 | 70 | .331 | .293 | 7,500 | 7.1 |
| EP-400-W | 6 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |
| | 24 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |
| | 90 | 270 | 2.566 | 2.222 | 4,500 | 19.7 |

Selection Guide Electrically Released Brakes

Electrically Released brakes fall within two categories: **Static Engage** and **Dynamic Stopping**. Static engage brakes are similar in function to an automotive parking brake: while they can be used to stop in an emergency, they are primarily to hold a load stationary after the load is already stopped. A static engage brake that is used as an active stopping brake at high cycle rate will wear out quickly.

Common industrial static applications are vertical or incline conveyors. The drive and motor may decelerate the conveyor to a stop and then engage the brake to hold the load in position. A second common application is where a servo or step motor will accelerate and decelerate the load and the brake holds the load in proper position.

Dynamic engage brakes are those designed to actively stop and hold the load. In these applications the brake is the force that stops the load as well as hold it. Dynamic engagement brakes are designed to provide appropriate life in applications where they experience frequent cycles per minute.











All electrically released brakes will engage when power is turned off and as such will provide emergency stop braking.

Static Engage Brakes

- ERS
- ERD
- EM/ERS

Dynamic Engage Brakes

- FB
- ER
- EM-FBB, FBC, MBFB
- UM-FBC and MBFB
- Unibrake

| | Model | Description / Application |
|----------------|--|--|
| Static Engage | ERS  | The ERS family of brakes is a spring set/ electrically released design. Excellent for use in holding applications. Torque ranges from 1.5 to 100 foot pounds. |
| | ERD  | The ERD family of brakes is a spring set/ electrically released design similar in concept to the ERS designs. The ERD family extends the torque ratings from 3 to 220 foot pounds. The ERD family also includes an adjustable torque option and manual release option. |
| | EM/ERS  | For C-face mounted applications the EM/ERS provides the ERS design with the easy to mount C-face mounting. |
| Dynamic Engage | ER  | ER brakes provide a permanent magnet engage/electrically released design. The customer assembled design of the ER family allows for ease of installation into unique customer applications requiring torque ranges from 10 to 400 foot pounds. |
| | FB  | The bearing mounted FB products are a permanent magnet engage/electrically released design. The bearing mounted design allows for simple mounting using just a torque arm for applications where a pre-assembled unit is desired and no mounting flange is available. Torque ranges from 10 to 56 foot pounds. |
| | FBB  | The C-face mount FBB units are designed to mount on the output side of a C-face motor where a brake only configuration is appropriate. |
| | MBFB  | The MBFB designs are the same as the FBB, except they are for the back of motor mounting for double C-face motors. |
| | FBC  | The C-face mount FBC units are designed to work with the clutch design for applications needing an electrically engaged clutch and electrically released brake. |
| | Unibrake  | The Unibrake designs are a spring set/ solenoid release brake for mounting to the back of the motor. This is a lower cost, lower cycle rate design compared to the MBFB. Adjustable torque and manual release are standard features. |
| | Unibrake Coupler  | The coupler design of the Unibrake family is designed for mounting on the output side of a motor where a spring set/solenoid release brake is desired. Adjustable torque and manual release are standard features. |

Selection Guide Electrically Released Brakes

| Load Holding | Manual Release | Bearing Mount | Flange Mount | C-Face Mtg Front of Motor | C-Face Mtg Back of Motor | Back of Motor Mount | Back of Motor Enclosure | Coil Voltage | Adjustable Torque |
|--------------|----------------|---------------|--------------|---------------------------|--------------------------|---------------------|-------------------------|--------------|-------------------|
| yes | no | - | - | no | - | yes | no | DC | no |
| yes | yes | - | - | no | - | yes | no | DC | yes |
| yes | no | - | - | yes | - | no | no | DC | no |
| yes | no | no | yes | no | no | - | - | DC | yes |
| yes | no | yes | no | no | no | - | - | DC | yes |
| yes | no | no | | brake only | no | - | - | DC | yes |
| yes | no | no | | no | yes | - | - | DC | yes |
| yes | no | no | | with clutch | no | - | - | DC | yes |
| yes | yes | no | | no | yes | - | - | AC | yes |
| yes | yes | no | | yes | no | - | - | DC or AC | yes |

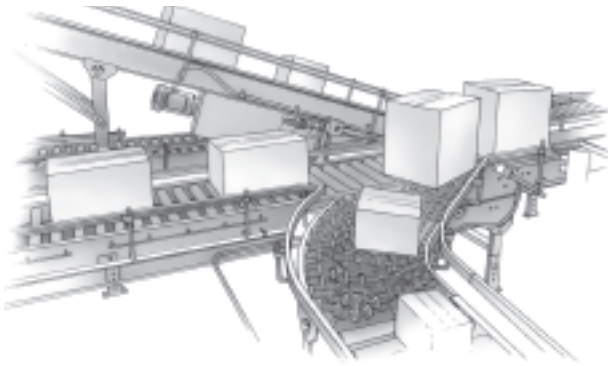
Spring-Set Electrically Released Brakes

Spring Set Brakes



Robotics

ERS Brakes can position and hold robotic equipment. Emergency braking in the event of power loss can prevent damage to equipment.



Automated Material Handling Systems

ERS Brakes hold rollers and lift mechanisms in place, and lock drive wheels in place.

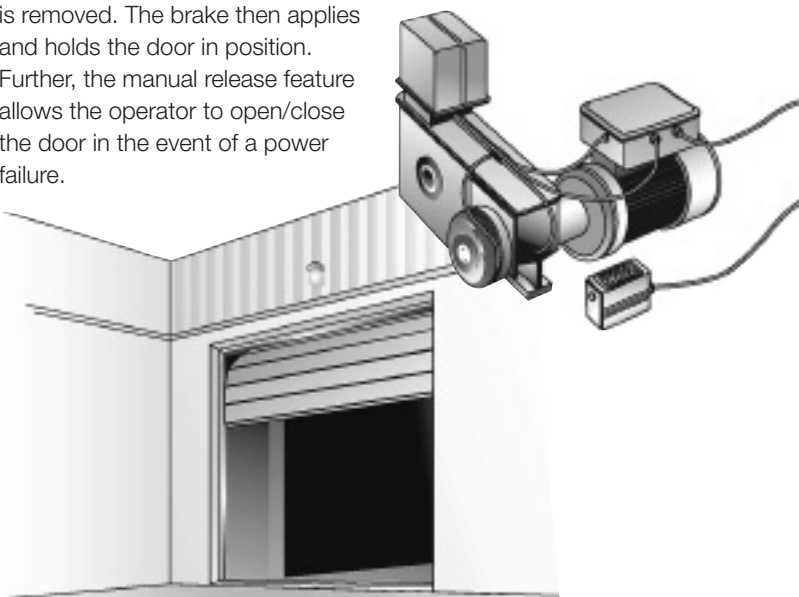


Medical Equipment

ERS brakes are used as parking brakes in wheelchairs and holding brakes in medical apparatus such as mammography and cat scan equipment.

Overhead Door

The ERD can be used in conjunction with a photo eye. In this application, whenever the light beam is broken, voltage to the brake is removed. The brake then applies and holds the door in position. Further, the manual release feature allows the operator to open/close the door in the event of a power failure.

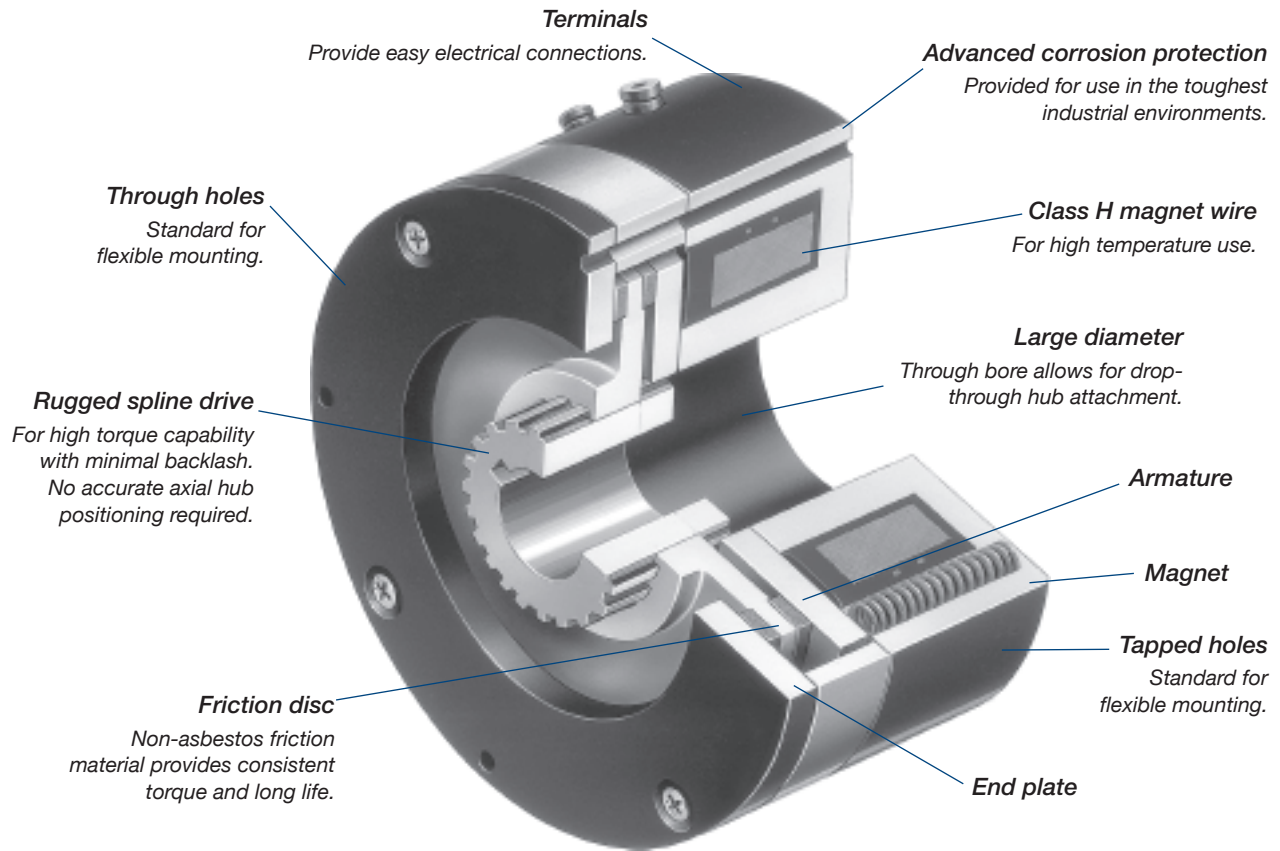


Mobile Equipment

ERS Brake, applied as a parking brake function on lift trucks, prevent rolling on slanted surfaces without the need for manual brake linkage or expensive hydraulic brakes.

ERS Series Electrically Released Brakes

For Static Holding and Emergency Stopping



Packaged Performance

Warner Electric ERS Brakes are pre-assembled and burnished at the factory. The engineering is built-in. Each unit is checked to ensure full rated torque right out-of-the-box. Just secure the hub, bolt down the brake and wire it up. An optional AC to DC control is available for use with all 90 volt units. Unique mounting features make it easy to adapt the ERS Brake to almost any application requirement.

ERS brakes are available in NEMA C-face mounted modules. Please consult factory for assistance.

Features

- Designed for static holding operations
- Brake automatically engages when power is turned off
- Flexible mounting
- Electrically released – spring actuated
- Quick, quiet response for rapid engagement
- Compact, low profile design saves space
- Spline drive for high torque, minimal backlash and long life
- Available in five sizes. Static torque ratings from 1.5 lb.ft. to 100 lb.ft.
- ERS-26 and ERS-42 UL listed.

Principle of Operation

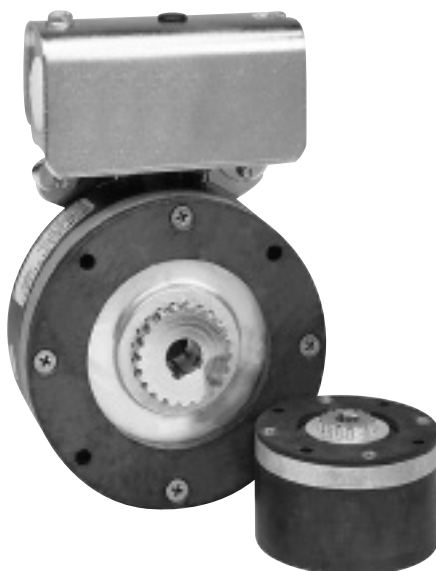
ERS Brake torque is developed when springs apply a clamping force between the brake armature and the friction disc to the end plate. Spring clamping force provides the holding torque of the brake.

To release the brake, electrical power is applied to the magnet coil, generating a magnetic attractive force between the armature and magnet. The magnetic force overcomes the spring action, allowing the friction disc to rotate freely.

“Electrically Released” brakes are so named because, when power is removed, the brake will stop and hold a load. This occurs when power is lost either intentionally or unexpectedly due to a machine malfunction. When power is on, the brake electrically releases the load, allowing it to move freely.

ERS Series Electrically Released Brakes

Selection



Sizing

Three factors are important for proper sizing:

- Static holding torque requirement
- System inertia and brake RPM
- Stopping time

Step 1

Holding Torque

Select the size unit with torque capacity closest to, but not less than, the holding torque required.

| Brake Size | Holding Torque Rating lb. ft. |
|------------|-------------------------------|
| ERS-26 | 1.5 |
| ERS-42 | 7.0 |
| ERS-49 | 15.0 |
| ERS-57 | 34.0 |
| ERS-68 | 100.0 |

Step 2

System Inertia/Emergency Stop

In an emergency stop (when power is interrupted), the ERS Brake will engage and bring the load to a stop. To properly size a brake for this application, load inertia must be known. This is the total inertia of all components which are to be brought to a stop. Adding the inertia of the ERS Brake is not necessary; it has been included in the selection chart.

With the load inertia and brake RPM known, use the Emergency Stop Selection Chart to verify your brake selection. Simply locate the intersection of your RPM and inertia and make sure you are not above the line for the brake you selected based on Holding Torque (Step 1). If you are above the line, select the brake designated by the next higher line.

Selection Procedure

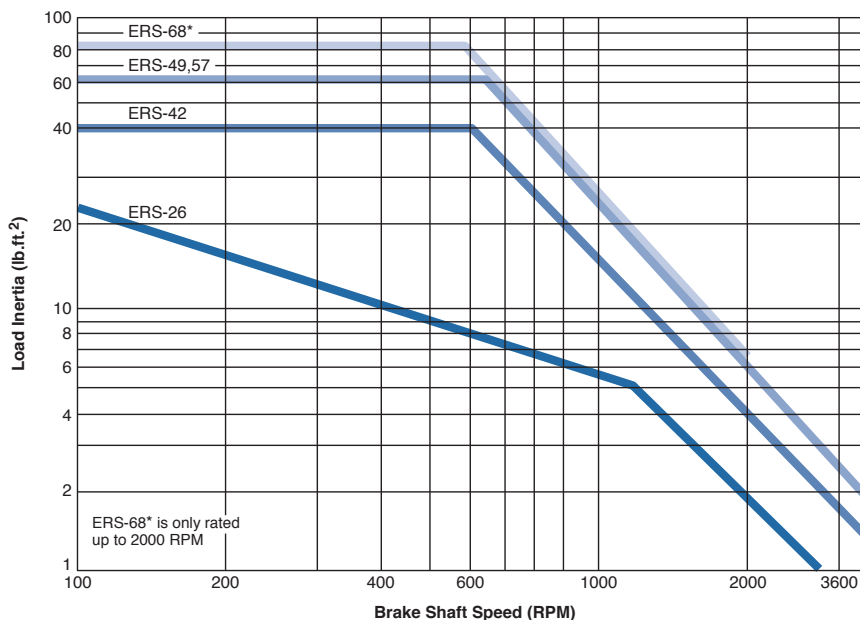
ERS Brakes are available in five models for an optimum size to match your application requirements. Static torque capabilities range from 1.5 lb.ft. to 100 lb.ft.

The stopping function is an important consideration when deciding which brake to use. Will the brake be engaged and disengaged in a static condition (zero speed difference between the armature disc and the friction disc)? If yes, the ERS Brake is the right choice.

Will the brake be normally engaged and disengaged in a static condition with intermittent engagements dynamically? An emergency stop is a good example. If yes, the ERS Brake is the ideal choice.

Will the brake be subject to frequent dynamic braking action? If yes, then a Warner Electric ER, FB or ERD brake should be considered. The ERS Brake is not the best choice for use as a high cycle rate dynamic brake.

Emergency Stop Selection Chart



*ERS-68 is only rated up to 2000 RPM

Step 3

Stopping Time

In some applications, it is desirable to know how fast a brake will bring a load to rest. The time to stop a load can be determined if the system inertia and brake holding torque are known, according to the following equation:

$$\text{Where: } t = \frac{WR^2N}{308T}$$

t = time to stop the load in seconds (sec.)

WR² = system inertia at the brake location in pound-feet squared (lb.ft.²)

N = speed of the brake shaft in revolutions per minute (RPM)

T = rated brake holding torque in pound-feet (lb.ft.) See step 1, page 110.

Actual stopping times depend on application variables, which include brake temperature, electrical suppression (see the brake apply time data below), manufacturing tolerances, friction material wear, etc. For this reason, specific stop times should be evaluated under actual application conditions.

If your application has special requirements, please call us.

Step 4

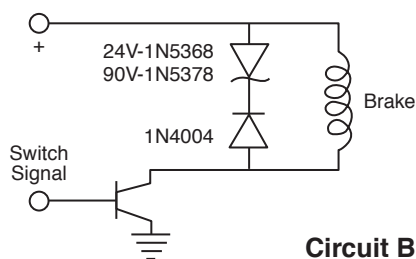
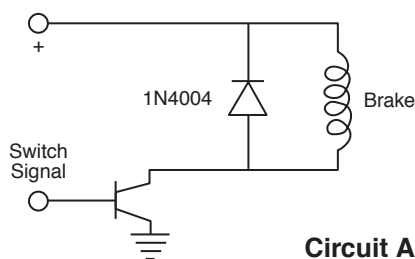
Select Control

Consult the Controls Section for control product overview. The holding torque for an ERS is not adjustable. Therefore, an adjustable torque control is not required.

Brake Apply/Release Time (Typical Values)

| Model | Brake Release Time (Seconds) | | Brake Apply Time (Seconds) | | | |
|--------|------------------------------|------|----------------------------|------|-----------------------|------|
| | 24V | 90V | Suppression Circuit A | | Suppression Circuit B | |
| | | | 24V | 90V | 24V | 90V |
| ERS-26 | 0.03 | 0.03 | 0.04 | 0.04 | 0.01 | 0.01 |
| ERS-42 | 0.05 | 0.06 | 0.10 | 0.10 | 0.01 | 0.02 |
| ERS-49 | 0.07 | 0.08 | 0.15 | 0.15 | 0.02 | 0.02 |
| ERS-57 | 0.11 | 0.11 | 0.15 | 0.15 | 0.02 | 0.02 |
| ERS-68 | 0.16 | 0.20 | 0.20 | 0.20 | 0.03 | 0.03 |

Note: Release and Apply Times are armature engagement and release only.



ERS Series Electrically Released Brakes

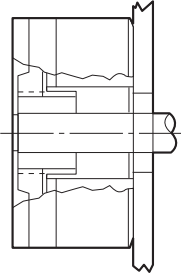
Armatures/Hubs

Armature Drives

The rugged splined drive provides flexibility in selecting the most efficient method of coupling a load to the ERS Brake. Each unit size has standard splined hubs available for common shaft sizes.

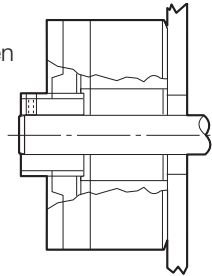
Recessed Hub

For maximum space efficiency, mount hub on shaft, then mount brake over hub.



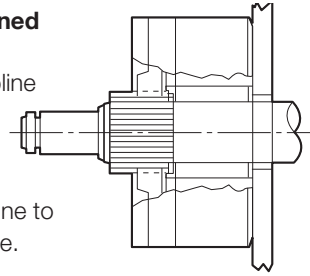
Extended Hub

Mount brake first, then position hub on shaft so hub is beyond the brake.



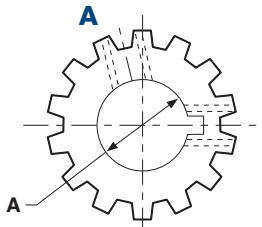
Mating Splined Member

Machined spline on drive member matches armature spline to operate brake.

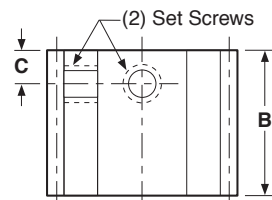
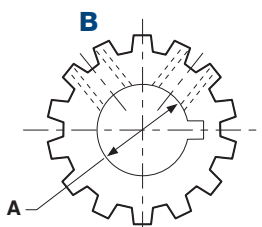


Drive Hub/Spline and Interface Data

Set Screw Orientation



Set Screw Orientation



| Model | A Bore | Mating Key (Not furnished) | Set screw Orientation | B Nom. | C Nom. | Set Screws | No. of Teeth | Dia. Pitch | Pressure Angle |
|--------|---------------|----------------------------|-----------------------|--------|--------|------------|--------------|------------|----------------|
| ERS-26 | .2525/ .2505 | 1/16 x 1/16 | B | .600 | .135 | 6-32 | 14 | 20/40 | 30° |
| | .3150/ .3130 | 1/16 x 1/16 | B | | | | | | |
| | .3775/ .3755 | 3/32 x 3/32 | B | | | | | | |
| ERS-42 | .3775/ .3755 | 3/32 x 3/32 | A | .700 | .150 | 8-32 | 19 | 16/32 | 30° |
| | .5025/ .5005 | 1/8 x 1/8 | A | | | | | | |
| | .6275/ .6255 | 3/16 x 3/16 | A | | | | | | |
| | .7525/ .7505 | 3/16 x 3/16 | B | | | | | | |
| | .7525/ .7505 | 3/16 x 3/16 | B | | | | | | |
| ERS-49 | .3775/ .3755 | 3/32 x 3/32 | A | .800 | .160 | 10-32 | 21 | 16/32 | 30° |
| | .5025/ .5005 | 1/8 x 1/8 | A | | | | | | |
| | .6275/ .6255 | 3/16 x 3/16 | A | | | | | | |
| | .7525/ .7505 | 3/16 x 3/16 | B | | | | | | |
| | .8775/ .8755 | 3/16 x 3/16 | B | | | | | | |
| ERS-57 | .5025/ .5005 | 1/8 x 1/8 | A | .800 | .190 | 1/4-20 | 15 | 10/20 | 30° |
| | .6275/ .6255 | 3/16 x 3/16 | A | | | | | | |
| | .7525/ .7505 | 3/16 x 3/16 | A | | | | | | |
| | .8755/ .8755 | 3/16 x 3/16 | B | | | | | | |
| | 1.0025/1.0005 | 1/4 x 1/4 | B | | | | | | |
| ERS-68 | 1.0025/1.0005 | 1/4 x 1/4 | A | .900 | .190 | 1/4-20 | 22 | 10/20 | 30° |
| | 1.1275/1.1255 | 1/4 x 1/4 | A | | | | | | |
| | 1.2525/1.2505 | 1/4 x 1/4 | A | | | | | | |
| | 1.3775/1.3755 | 5/16 x 5/16 | A | | | | | | |
| | 1.5025/1.5005 | 3/8 x 3/8 | B | | | | | | |

Note: Involute spline data per ANSI B92. 1a-1976, Class 5.

Backlash

Total unit backlash includes spline and armature movement. It is typically less than one degree of rotation. Spline backlash alone is typically 15 minutes of rotation or less.

ERS Series Electrically Released Brakes

Mounting

Mounting Orientation

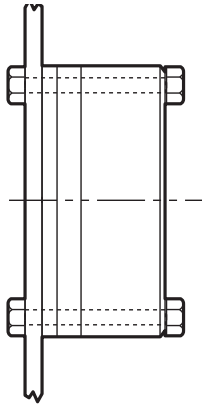
ERS Brakes are easily modified to accommodate different mounting orientations. The brake can be mounted with either face against the mounting surface. The following mountings are possible with the standard ERS brake.

Mounting Requirements

1. Mounting surface to be perpendicular to shaft with in .006" T.I.R.
2. Mounting holes to be within .015" true position to the shaft.

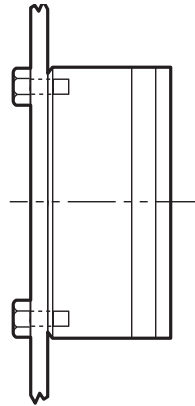
Through Bolt

Provides rigid support. May be mounted on either side of brake.



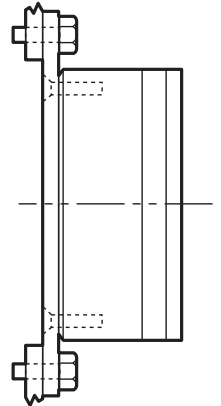
Tapped Hole

Works well where through bolt mounting is impractical.

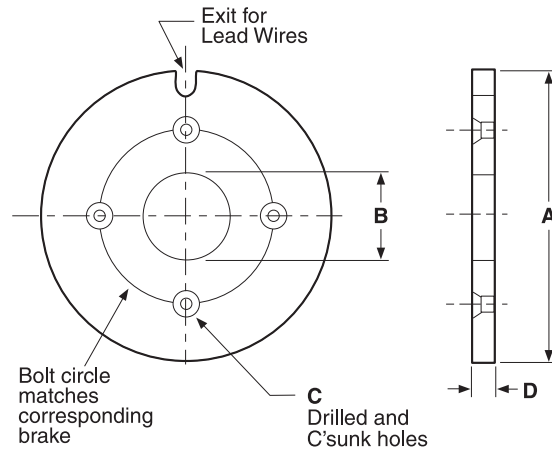


Flange

Flange mounting to brake tapped holes for most versatile attachment to many different housings, motors, and frames.



Optional Adapter Mounting Flange



| Model | A Nom. | B Nom. | C Holes | D Nom. |
|--------|--------|--------|---------|--------|
| ERS-26 | 4.000 | .935 | #4 | .100 |
| ERS-42 | 5.000 | 1.450 | #6 | .144 |
| ERS-49 | 6.250 | 1.575 | #8 | .193 |
| ERS-57 | 7.500 | 1.825 | #10 | .193 |
| ERS-68 | 9.500 | 2.500 | 1/4 | .224 |

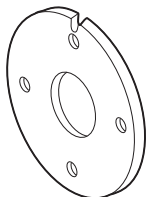
Note: Holes for attaching flange to mounting surface to be provided by customer.

ERS Series Electrically Released Brakes

Ordering Information

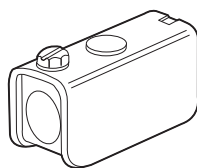
Accessories

Adapter Flanges



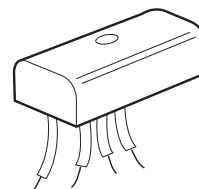
| Model | Part Number |
|--------|-------------|
| ERS-26 | 686-0182 |
| ERS-42 | 686-0183 |
| ERS-49 | 686-0184 |
| ERS-57 | 686-0185 |
| ERS-68 | 686-0186 |

Conduit Box



| Model | Part Number |
|----------------------------------|--------------|
| Conduit Box | 5154-101-001 |
| Mounts to ERS-49, 57 and 68 only | |

Controls



| Model | Part Number |
|-----------|--------------|
| CBC-100-1 | 6003-448-101 |

AC to DC Control

To be used with 90V ERS brakes

See the Controls Section on page 201 for complete information.

CBC-100-1 is 110 volt only

Ordering Information

Ordering the appropriate ERS brake for your application is a simple, step-by-step procedure based on the intended function, brake size, mounting configuration and operating voltage of the unit best suited for your needs, including any optional parts and accessories that you may require. A Warner Electric sales representative or distributor is always happy to provide assistance.

How to Order

1. Verify that the brake is to be used in a static holding/intermittent engagement application.
2. Choose the correct size ERS Brake from the selection procedure on pages 110-111. Select the correct brake part number for the appropriate size and desired operating voltage.
3. Choose the splined hub part number for the required bore diameter and unit size.

4. Select optional accessories, such as: adapter flange kit, AC to DC control and conduit box kit.

ERS Brake

| Model | Voltage | Part Number |
|--------|---------|--------------|
| ERS-26 | 24V | 5158-170-016 |
| | 90V | 5158-170-015 |
| ERS-42 | 24V | 5151-170-002 |
| | 90V | 5151-170-001 |
| ERS-49 | 24V | 5155-170-002 |
| | 90V | 5155-170-001 |
| ERS-57 | 24V | 5153-170-003 |
| | 90V | 5153-170-002 |
| ERS-68 | 24V | 5154-170-002 |
| | 90V | 5154-170-001 |

Splined Hub

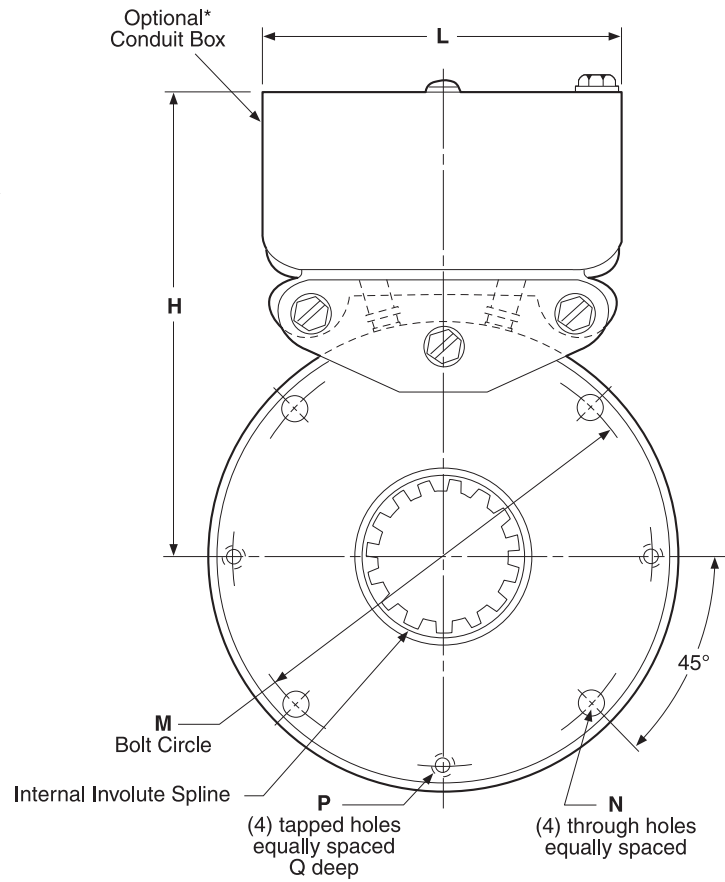
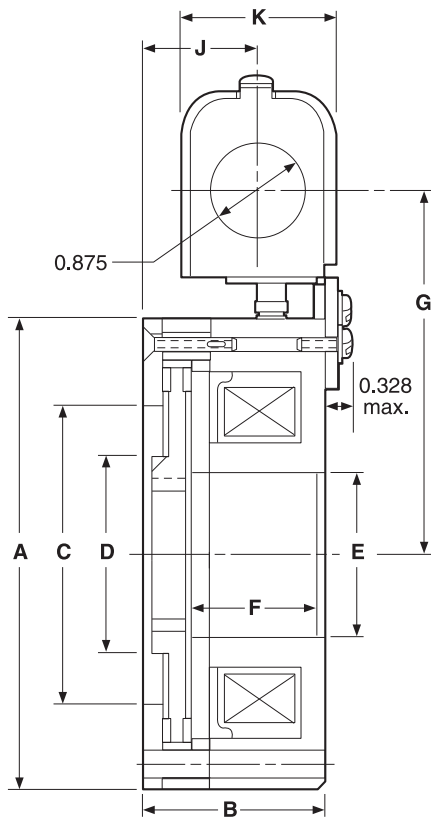
| Model | Bore Dia. | Part Number |
|--------|-----------|--------------|
| ERS-26 | .250 | 5158-541-006 |
| | .312 | 5158-541-007 |
| | .375 | 5158-541-008 |
| ERS-42 | .375 | 5151-541-002 |
| | .500 | 5151-541-003 |
| | .625 | 5151-541-004 |
| ERS-49 | .750 | 5151-541-005 |
| | .375 | 5155-541-002 |
| | .500 | 5155-541-003 |
| ERS-57 | .625 | 5155-541-004 |
| | .750 | 5155-541-005 |
| | .875 | 5155-541-006 |
| ERS-68 | 1.000 | 5153-541-004 |
| | .625 | 5153-541-005 |
| | .750 | 5153-541-006 |
| ERS-68 | .875 | 5153-541-007 |
| | 1.000 | 5153-541-008 |
| | 1.000 | 5154-541-005 |
| ERS-68 | 1.125 | 5154-541-006 |
| | 1.250 | 5154-541-007 |
| | 1.375 | 5154-541-008 |
| ERS-68 | 1.500 | 5154-541-009 |

Special Requirements

ERS Brake modifications such as metric bores, special voltages and low torque units are available. Consult factory.

ERS Series Electrically Released Brakes

ERS-26, ERS-42, ERS-49, ERS-57, ERS-68



*Available only for the ERS-49, 57, and 68 sizes

ERS Series Electrically Released Brakes

ERS-26, ERS-42, ERS-49, ERS-57, ERS-68

Dimensions

All dimensions are nominal, unless otherwise noted.

| Model | A Max. | B Max. | C | D | E | F | G |
|--------|--------|--------|-------|-------|-------|-------|-------|
| ERS-26 | 2.460 | 1.515 | 1.375 | 1.125 | .860 | 1.250 | — |
| ERS-42 | 3.520 | 1.595 | 2.000 | 1.600 | 1.375 | 1.255 | — |
| ERS-49 | 4.270 | 1.767 | 2.600 | 1.750 | 1.500 | 1.332 | 3.625 |
| ERS-57 | 5.020 | 1.937 | 3.240 | 2.100 | 1.750 | 1.503 | 4.000 |
| ERS-68 | 6.520 | 2.030 | 4.504 | 2.800 | 2.425 | 1.565 | 4.750 |

| Model | H | J | K | L | M Dia. | N Dia. | P | Q |
|--------|-------|-------|-------|-------|--------|-----------|--------|------|
| ERS-26 | — | — | — | — | 2.125 | .172/.164 | 4-40 | .375 |
| ERS-42 | — | — | — | — | 3.125 | .200/.190 | 6-32 | .400 |
| ERS-49 | 4.625 | 1.000 | 1.625 | 3.750 | 3.750 | .228/.218 | 8-32 | .400 |
| ERS-57 | 5.000 | 1.170 | 1.625 | 3.750 | 4.500 | .288/.278 | 10-24 | .400 |
| ERS-68 | 5.750 | 1.265 | 1.625 | 3.750 | 5.875 | .413/.404 | 1/4-20 | .500 |

Specifications

| Model | Voltage DC | Power (Watts) | Current (Amperes) | Resistance (Ohms) | Static Torque (lb.ft.) | Inertia (lb.in. ²) | | Weight (lbs.) | |
|--------|------------|---------------|-------------------|-------------------|------------------------|--------------------------------|-------|---------------|------|
| | | | | | | Unit | Hub | Unit | Hub |
| ERS-26 | 24V | 17.6 | 0.733 | 32.75 | 1.5 | 0.03 | 0.004 | 1.20 | 0.06 |
| | 90V | 16.0 | 0.178 | 506.5 | | | | | |
| ERS-42 | 24V | 23.3 | 0.973 | 24.67 | 7 | 0.14 | 0.040 | 2.50 | 0.20 |
| | 90V | 21.5 | 0.239 | 376.2 | | | | | |
| ERS-49 | 24V | 27.3 | 1.136 | 21.12 | 15 | 0.45 | 0.060 | 4.30 | 0.25 |
| | 90V | 25.8 | 0.287 | 313.6 | | | | | |
| ERS-57 | 24V | 36.2 | 1.510 | 15.9 | 34 | 0.54 | 0.110 | 6.50 | 0.38 |
| | 90V | 35.2 | 0.391 | 230.1 | | | | | |
| ERS-68 | 24V | 54.9 | 2.286 | 10.5 | 100 | 1.44 | 0.550 | 11.30 | 0.75 |
| | 90V | 51.9 | 0.577 | 155.9 | | | | | |

Spring-Set Brake Modules Electrically Released Brakes

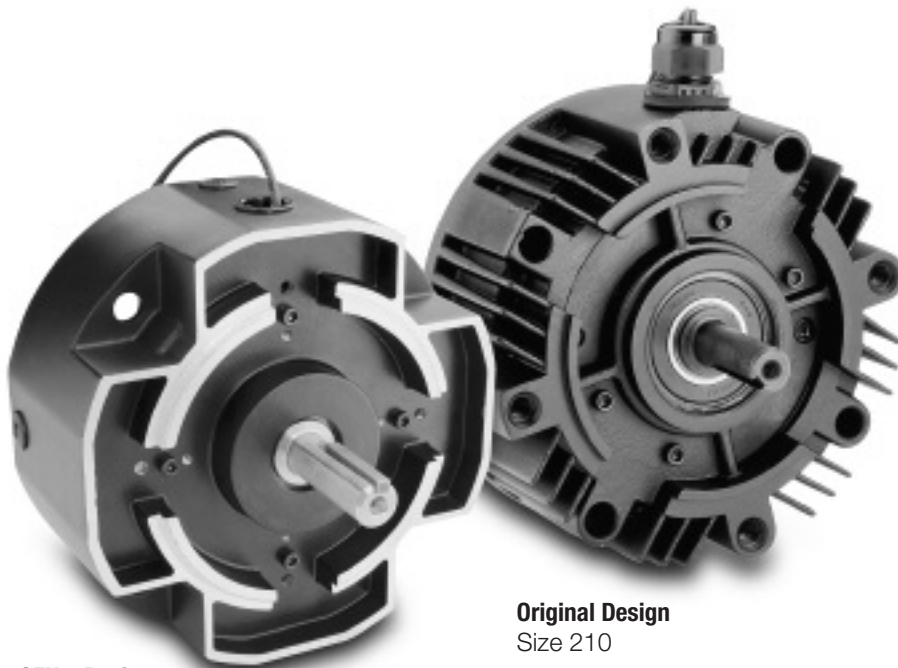
SSBM Series- EM/ERS

Packaged Spring-Set Brake Module for Holding Applications

The Spring-Set Brake Module is a NEMA C-face compatible unit designed to perform holding as well as occasional emergency stopping functions, making it particularly well-suited for motor brake applications. Because it is designed to be mounted on the front of a motor, it is an excellent choice for retrofitting an existing motor, or for use on custom designed machinery.

Features

- NEMA C-face compatible mounting
- Performs holding functions with occasional e-stops
- Completely assembled and preburnished at the factory
- Easy to install
- No adjustment required
- High torque, lead-free and asbestos-free friction material



GEN 2 Design
Sizes 50 &180

Original Design
Size 210

Principle of Operation

SSBM Brake torque is developed when springs apply a clamping force between the brake armature and the friction disc to the end plate. Spring clamping force provides the holding torque of the brake.

To release the brake, electrical power is applied to the magnet coil, generating a magnetic attractive force between the armature and magnet. The magnetic force overcomes the spring action, allowing the friction disc to rotate freely.

Specifications

| Model | NEMA Frame Size | Holding Torque (ft-lbs) | Max RPM | Unit Weight (lbs) | Unit Inertia (lb-in ²) | Voltage (DC) | Power (Watts) | Current (Amperes) | Resistance (Ohms) | GEN 2 Part Number | Original Part Number |
|---------------|--------------------------|-------------------------|---------|-------------------|------------------------------------|--------------|---------------|-------------------|-------------------|-------------------|----------------------|
| EM-50/ERS-42 | 56C/48Y | 7.0 | 3600 | 6.4 | .295 | 24 | 23.3 | 0.973 | 24.67 | 5370-170-201 | 5370-170-122 |
| | | | | | | 90 | 21.5 | 0.239 | 376.2 | 5370-170-203 | 5370-170-123 |
| EM-50/ERS-49 | 56C/48Y | 15.0 | 3600 | 8.2 | .673 | 24 | 27.3 | 1.136 | 21.12 | 5370-170-206 | 5370-170-124 |
| | | | | | | 90 | 25.8 | 0.287 | 313.6 | 5370-170-207 | 5370-170-125 |
| EM-180/ERS-57 | 182C/143TC 184C/145TC | 34.0 | 3600 | 10.4 | .955 | 24 | 36.2 | 1.510 | 15.90 | 5370-170-211 | 5370-170-126 |
| | | | | | | 90 | 35.2 | 0.391 | 230.1 | 5370-170-212 | 5370-170-127 |
| EM-210/ERS-68 | 213C/182TC 215C/184TC | 100.0 | 2000 | 24.7 | 3.842 | 24 | 54.9 | 2.286 | 10.50 | | 5371-170-042 |
| | | | | | | 90 | 51.9 | 0.577 | 155.9 | | 5371-170-043 |

Spring-Set Brakes Electrically Released Brakes

SSBM Series-EM/ERS

Applications

The Warner Electric Spring-Set Brake Module is an ideal holding device in applications where the motor is used to stop and accurately position the load. The SSBM brake will hold the load in that position until electrically released. The SSBM is also a cost effective emergency stopping device in the event of power failure, machine malfunction, or other occasional dynamic stopping.

Application examples include holding railroad crossing arms, basketball backboards, robotic arms, and assemblies on vertical ball screws.

Selection

SSBM Series Brakes are available in four models with static torque capabilities ranging from 7.0 lb.ft. to 100 lb.ft.

The stopping function is an important consideration when deciding which brake to use. Will the brake be engaged and disengaged in a static condition (zero speed difference between the armature disc and the friction disc)? If yes, then the SSBM Brake is the right choice.

Will the brake be normally engaged and disengaged in a static condition with intermittent engagements dynamically? An emergency stop is a good example. If yes, then the SSBM Brake is the ideal choice.

Will the brake be subject to frequent dynamic braking action? If yes, then a Warner Electric EM-FBB, EUM-FBB, EM-MBFB, EUM-MBFB, EM-FBC or UM-FBC should be considered because these are the best choices for use as high cycle rate dynamic brakes in NEMA C-face applications.

Sizing

Four factors are important for proper sizing:

- Motor frame size
- Static holding torque requirement
- System inertia and brake RPM
- Stop time

Be sure to consider each of these factors as outlined below to effectively select the most appropriate brake for your application.

1. NEMA C-face Mounting

Verify the brake is to be used in a static holding/intermittent engagement application.

Based on the NEMA C-face frame size of the prime mover, select the correct brake module size from the Frame Size Selection Chart.

Frame Size Selection Chart

| NEMA Frame Size | Brake Model |
|--------------------------|------------------------------|
| 56C/48Y | EM-50/ERS-42 EM-50/ERS-49 |
| 182C/143TC 184C/145TC | EM-180/ERS-57 |
| 213C/182TC 215C/184TC | EM-210/ERS-68 |

2. Holding Torque

Select the size unit with the torque capacity closest to, but not less than, the holding torque required.

| Holding Torque Rating (ft.lb.) | Brake Model |
|--------------------------------|---------------|
| 7.0 | EM-50/ERS-42 |
| 15.0 | EM-50/ERS-49 |
| 34.0 | EM-180/ERS-57 |
| 100.0 | EM-210/ERS-68 |

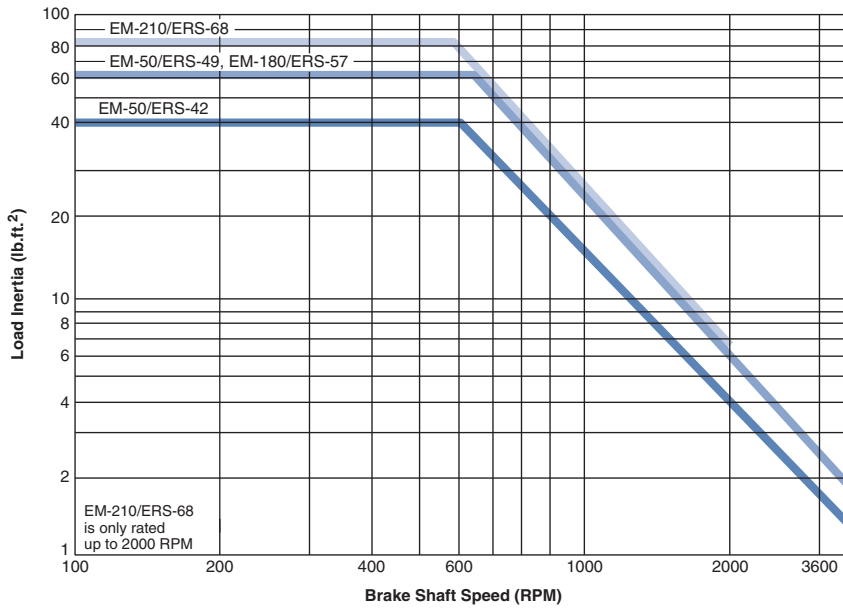
3. System Inertia/Emergency Stop

In an emergency stop (when power is interrupted), the SSBM will engage and bring the load to a stop. To properly size a brake for this application, load inertia must be known. This is the total inertia of all components which are to be brought to a stop. Adding the inertia of the SSBM Brake is not necessary as it has been included in the selection chart.

With the load inertia and brake RPM known, use the Emergency Stop Selection Chart to verify your brake selection. Simply locate the intersection of your RPM and inertia and make sure you are not above the line for the brake you selected based on Holding Torque (Step 1). If you are above the line, select the brake designed by the next higher line.

Spring-Set Brakes Electrically Released Brakes

Emergency Stop Selection Chart



Actual stopping times depend on application variables, which include brake temperature, electrical suppression (see the brake apply time data below), manufacturing tolerances, friction material wear, etc. For this reason, specific stop times should be evaluated under actual application conditions.

If your application has special requirements, please call Warner Electric Technical Support.

5. Select Control

Consult the Controls Section on page 201 for control product overview. The holding torque for a SSBM is not adjustable: therefore, an adjustable torque control is not required.

4. Stopping Time

In some applications, it is desirable to know how fast a brake will bring a load to rest.

The time to stop a load can be determined if the system inertia and brake holding torque are known, according to the following equation:

Where: $t = (WR^2N)/(308T)$

t = time to stop the load in seconds (sec.)

WR^2 = system inertia at the brake location in pound-feet squared (ft.lb²)

N = speed of the brake shaft in revolutions per minute (RPM)

T = rated brake holding torque in foot-pounds (ft.lb.)

Special Requirements

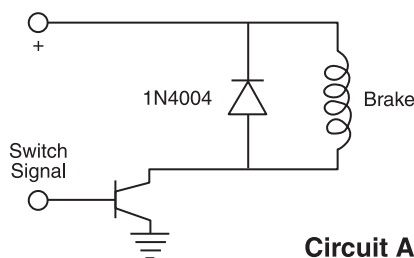
SSBM brake modifications, such as special voltages, rear motor mounting, and low torque units are available.

Contact Warner Electric Technical Support at 800-825-9050.

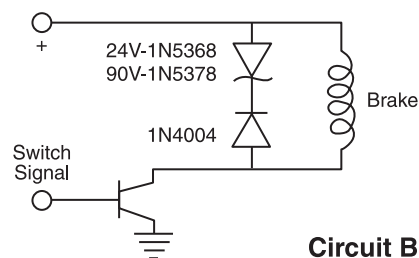
Brake Apply/Release Time (Typical Values)

| Model | Brake Release Time (Seconds) | | Brake Apply Time (Seconds) | | | |
|---------------|---------------------------------|------|----------------------------|------|-----------------------|------|
| | 24V | 90V | Suppression Circuit A | | Suppression Circuit B | |
| | | | 24V | 90V | 24V | 90V |
| EM-50/ERS-42 | 0.05 | 0.06 | 0.10 | 0.10 | 0.01 | 0.02 |
| EM-50/ERS-49 | 0.07 | 0.08 | 0.15 | 0.15 | 0.02 | 0.02 |
| EM-180/ERS-57 | 0.11 | 0.11 | 0.15 | 0.15 | 0.02 | 0.02 |
| EM-210/ERS-68 | 0.16 | 0.20 | 0.20 | 0.20 | 0.03 | 0.03 |

Note: Release and Apply Times are armature engagement and release only.



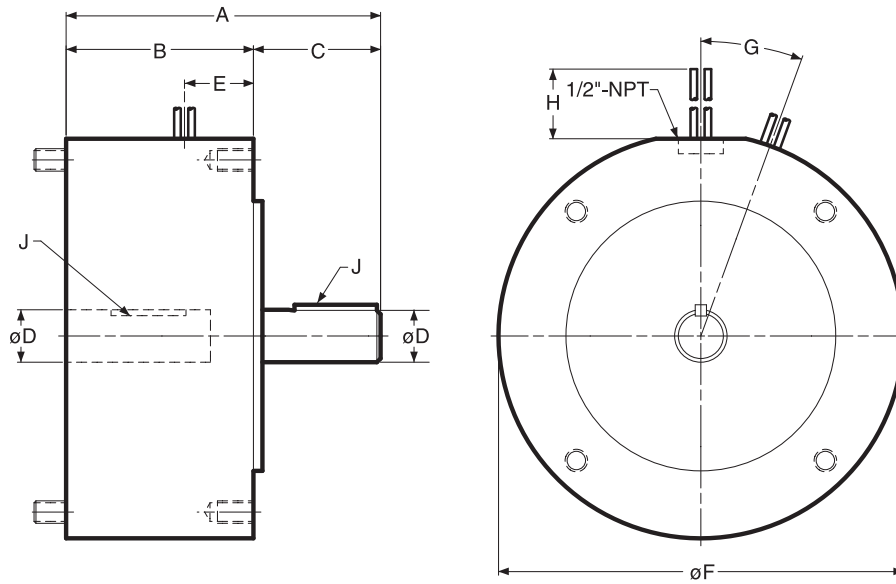
Circuit A



Circuit B

Spring-Set Brakes Electrically Released Brakes

SSBM Series-EM/ERS



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 5.197 | 3.125 | 2.072 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 5.257 | 3.125 | 2.132 | .875 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 7.533 | 4.914 | 2.619 | 1.125 | 1.812 | 9.344 | 65° | 36 | 1/4 x 1/4 |

For standard NEMA frame dimensions, see page 187.

Only 50 and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

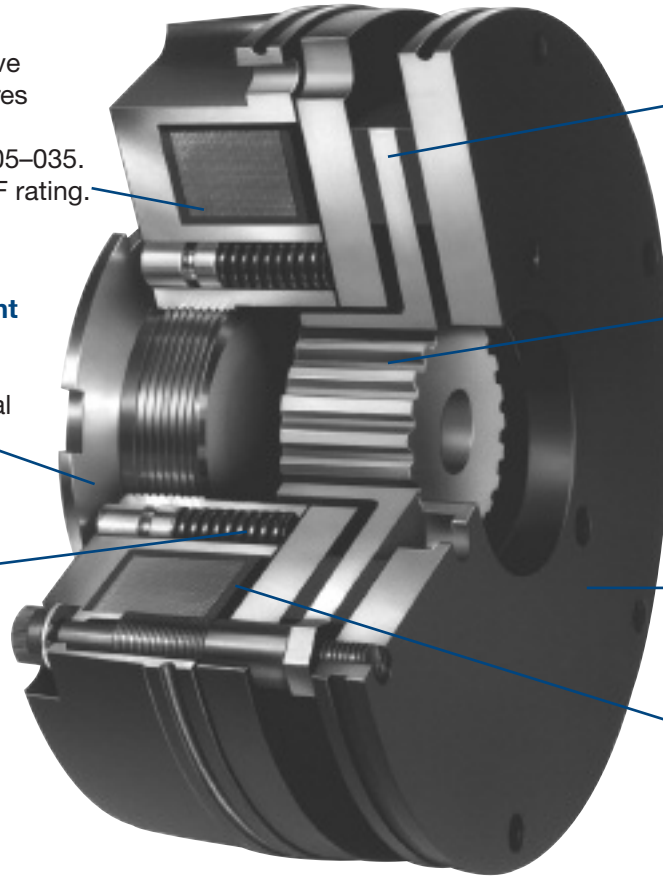
ERD Series Electrically Released Brakes

The Inside Story

Continuous duty coil is epoxy-sealed; windings have Class F insulation. Lead wires have standard Class B insulation rating on sizes 005–035. Sizes 060–300 have Class F rating.

Central Torque Adjustment (VAR 02) allows braking torque adjustment down to 50% of nominal rating; ideal for controlling stopping distances.

Compression Springs are used to provide balanced armature plate loading.



Friction Disc has double friction surfaces for increased torque in small package size.

Splined Center Hub is steel for wear resistance and available in a variety of bore sizes and keyways.

Friction Flange can easily be modified to suit unique bolt patterns. In special cases, brakes may be mounted directly to the motor without the need for the flange.

Air Gap is factory pre-set and easy to adjust during field maintenance.

ERD Series brakes are designed to safely keep the load in position in the event of a power or motor failure, whether intentional or accidental.

By applying voltage to the ERD, an electromagnetic field is created which causes the armature plate to pull-in against helical compression springs, thus releasing the brake. When power is removed, the springs force the armature to compress the friction carrier against the mounting flange, thus stopping and holding the load. Fully dynamic friction material on the carrier allows for repeated braking cycles from full motor speed with no torque fade.

An optional manual release allows the operator to safely move the load even when no power is available.

Brakes are available in eight different sizes ranging from 3.3 inches to 9.9 inches in diameter with torque capacities from 4 to 220 lb.ft.

Features/Benefits

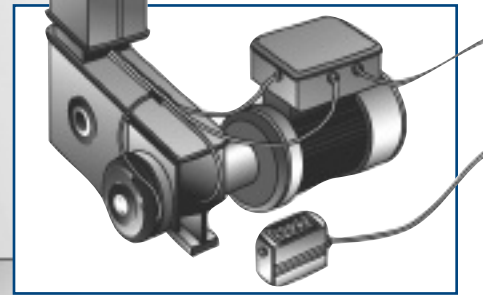
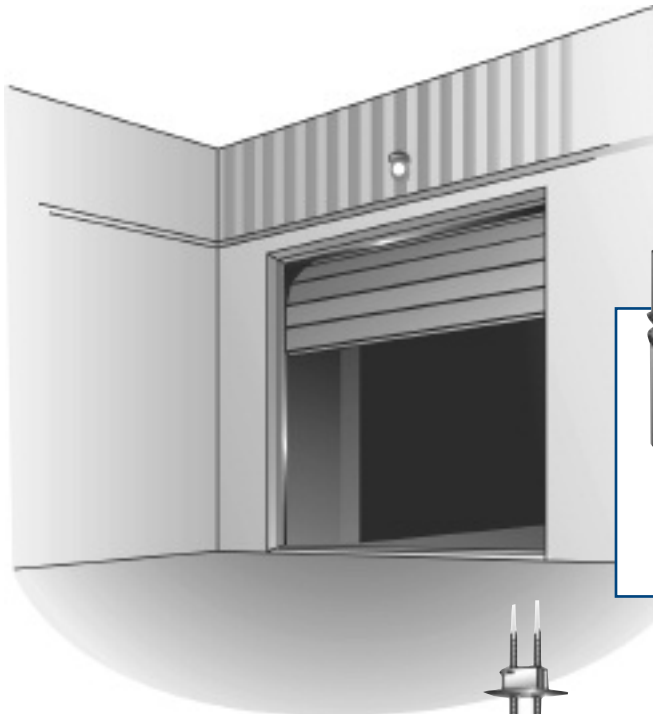
- Dynamic friction material can stop loads from motor speeds up to 3600 RPM.
- Few moving parts means quiet operation.
- Lead and asbestos free, dynamic friction material is suited for high cycle rates.
- Variety of voltages available.
- Simple DC control (or AC with available rectifiers).
- Low power requirements for energy savings.
- Bi-directional stopping capability.
- Epoxy encapsulated coil for uniform heat transfer.
- Corrosion resistant.
- Low inertia rotating parts.
- Splined hub for quiet dependable operation.
- Metric and inch standard bore sizes.

ERD Series Electrically Released Brakes

Applications

As a fail-safe, power-off brake, the ERD family is ideally suited for such load-stopping and holding applications as:

- Conveyors
- Machine Tools
- Robotics
- Medical X-Y Positioning
- Scooters
- Floor Sweepers/Cleaners
- Motor Brakes
- Overhead Doors
- Hoist/Winch
- Fork Lift

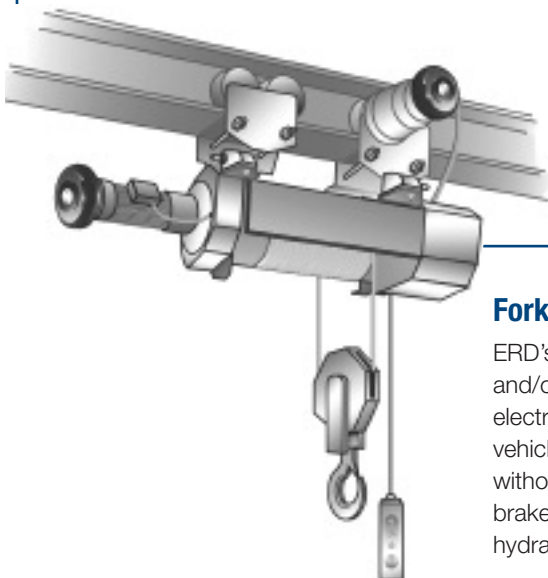
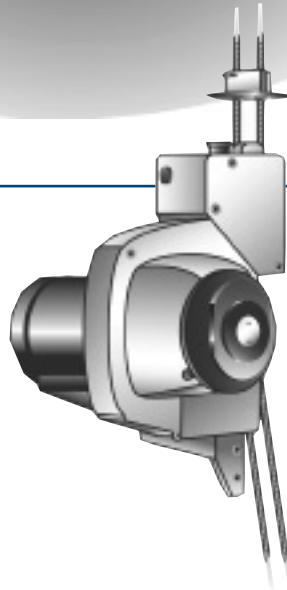


Overhead Door

The ERD can be used in conjunction with a photo eye. In this application, whenever the light beam is broken, voltage to the brake is removed. The brake then applies and holds the door in position. Further, the manual release feature allows the operator to open/close the door in the event of a power failure.

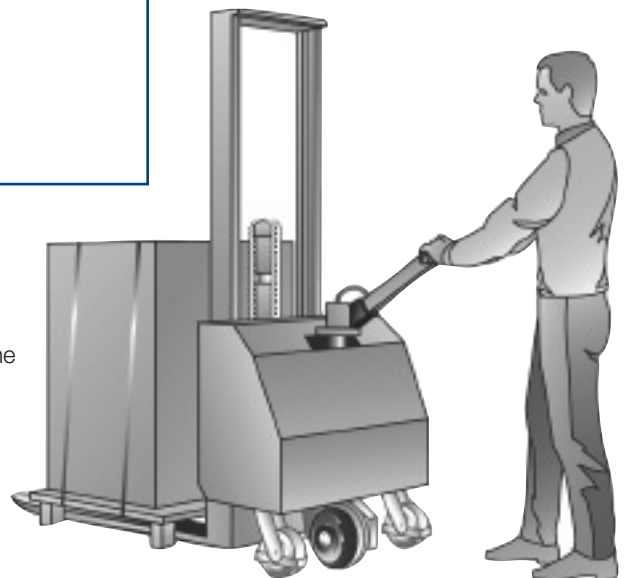
Hoist/Winch

The ERD with central torque adjustment can be used to consistently stop the rated load within a fixed distance by dialing-in the proper torque level on each production hoist. The addition of a manual release allows the load to be gradually and safely lowered to the ground in the event of power failure.



Fork Lift

ERD's are used as safety and/or parking brakes on electric fork trucks to hold the vehicle on inclines etc. without the need for manual brake linkage or expensive hydraulic brakes.



ERD Series Electrically Released Brakes

Selection Procedure

Proper fail-safe brake selection involves determining, in order:

1. Static Holding Torque

The ERD brake nominal holding torque should exceed the torque from the load by a minimum safety factor of 2.0.

2. Dynamic Torque

This is determined from the equation:

$$T = \frac{5250 P K}{N}$$

where:

- T = Dynamic Torque, ft.lb.
- N = Motor Speed, RPM
- P = Motor Horsepower
- K = Momentary Peak Torque Factor (Typically 2.5)

Once the dynamic torque has been calculated, check the dynamic torque curves (to the right) at the required operating speed to determine the suitable brake.

3. Energy Capacity (Heat Dissipation)

Sizing of the ERD by energy capacity is a function of the cycling frequency (cycles per hour) and the single cycle energy put into the brake as determined from the equation:

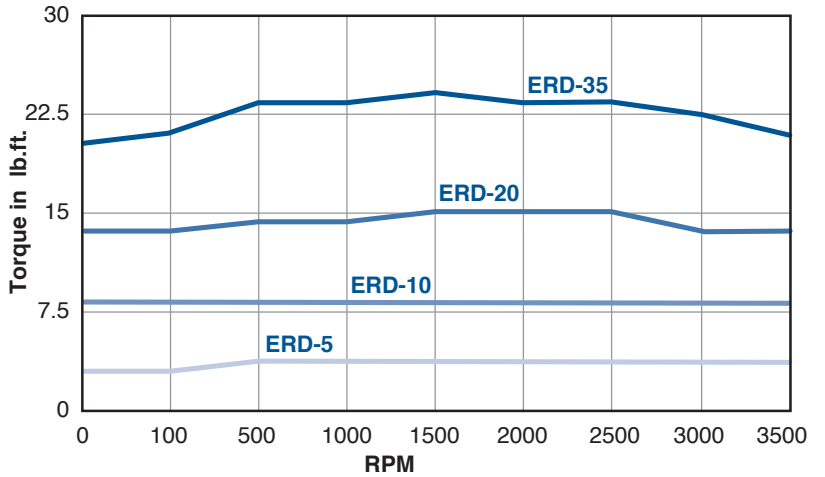
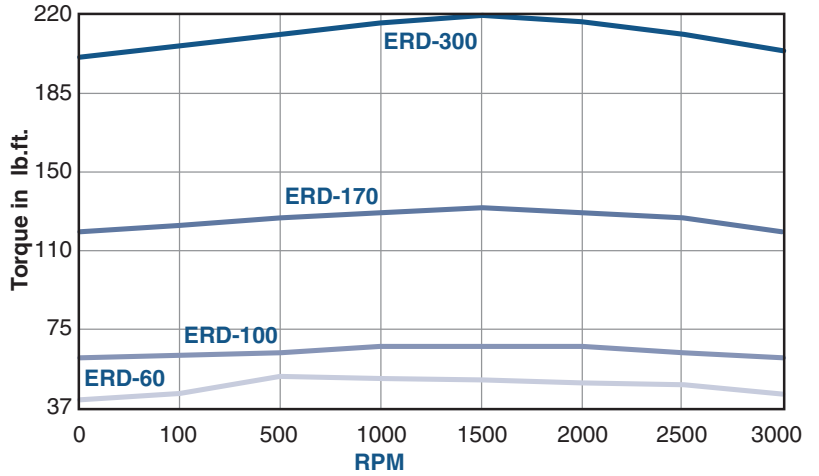
$$E = 1.7 WR^2 \left(\frac{N}{100} \right)^2$$

where:

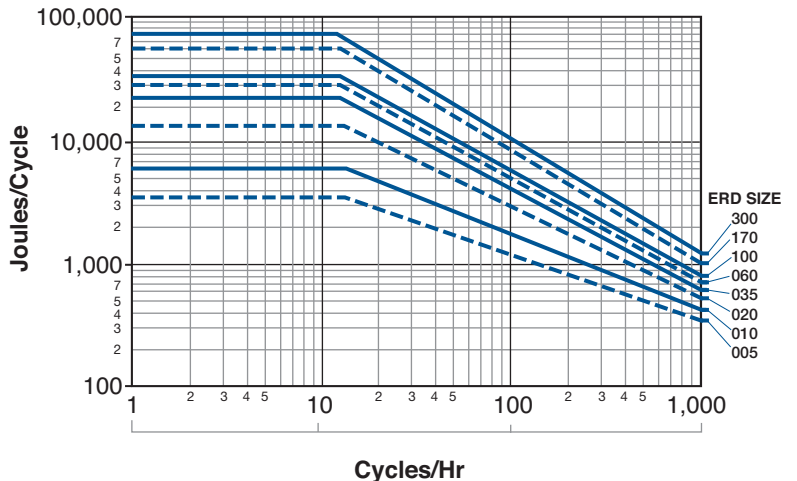
- E = Single Cycle Energy, ft.lb.
- WR² = Load Inertia, lb.ft²
- N = Speed, RPM

Applying the energy per cycle with the cycle rate to the energy curve, the brake selection is verified.

Dynamic Torque



Energy Capacity (Heat Dissipation)



Note: To convert Joules/min. to ft.lbs./min, multiply times .7376

ERD Series Electrically Released Brakes

Specifications

| Options | | Units | ERD 5 | ERD 10 | ERD 20 | ERD 35 | ERD 60 | ERD 100 | ERD 170 | ERD 300 |
|-----------------------------------|------------|---------------------|-------|--------|--------|--------|--------|---------|---------|---------|
| Holding Torque | | in.lb. | 45 | 85 | 175 | 310 | 530 | 890 | 1500 | 2650 |
| | | ft.lb. | 4 | 7 | 15 | 26 | 44 | 75 | 125 | 221 |
| Maximum Speed | | RPM | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 | 3600 |
| Rotating Inertia | S | lb.in. ² | 0.041 | 0.137 | | | | | | |
| | M | lb.in. ² | 0.103 | 0.321 | 0.957 | 2.529 | 7.415 | 12.472 | 14.010 | 29.386 |
| Current Draw | | Amps | | | | | | | | |
| | 24 VDC | | 0.83 | 1.03 | 1.22 | 1.61 | 1.94 | 2.35 | 2.73 | 4.11 |
| | 103.5 VDC* | | 0.21 | 0.26 | 0.31 | 0.41 | 0.49 | 0.57 | 0.69 | 1.122 |
| | 207 VDC* | | 0.09 | 0.12 | 0.14 | 0.18 | | | | |
| Resistance at Ambient Temperature | 24 VDC | Ohms | 28.9 | 23.4 | 19.6 | 14.9 | 12.4 | 10.22 | 8.78 | 5.83 |
| | 103.5 VDC* | | 454 | 372 | 310 | 233 | 166.2 | 168.6 | 139.2 | 85.63 |
| | 207 VDC* | | 2380 | 1813 | 1545 | 1175 | | | | |
| Weight | | lbs | 2 | 4 | 7 | 10 | 14 | 22 | 34 | 57 |

* The controls designed on pages 130 and 131 provide output voltages to operate these brakes.

Ordering Procedure

Specify:

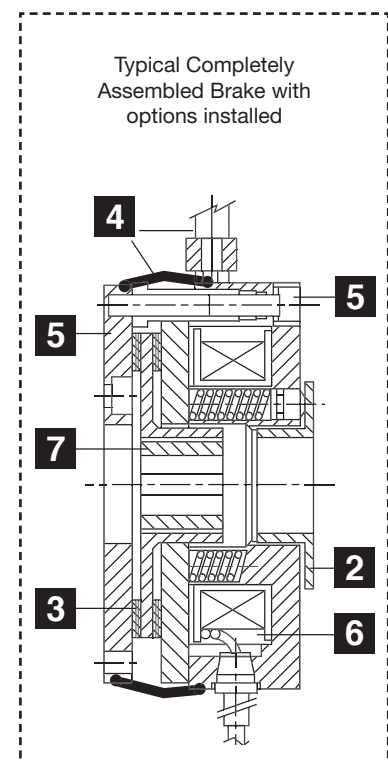
- Size: upon sizing criteria, select a size.
5, 10, 20, 35, 60, 100, 170, or 300
- Variation:
0 – No torque adjustment
2 – With central torque adjusting ring
- Friction Disc:
Metallic carrier is standard.
Thermoplastic carrier is available on sizes 5 & 10.
High torque carrier available on sizes 060 through 300.
- Options:
Dust Cover
Manual Release
- Friction Flange & Mounting Screws:
Thick Flange is standard – Requires Short Screws.
Intermediate Flange available up to Size 35 – Requires Long Screws.
No Mounting Flange is an option – Requires Long Screws.

- Voltage:
24 DC is standard.
96, 103.5 (90)* & 207/215* DC are modifications.
- Bore Size:
Pilot bored hubs available in all sizes.
See table for US-English and Metric bore sizes available by ERD size.
Special bores available on request.
- Detection Kit – Micro Switch
For Service Manual, request catalog P-229. This option not retrofittable. Requires a 25 piece minimum order for sizes 005 thru 035.

Caution:

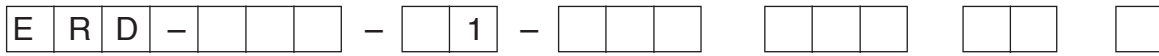
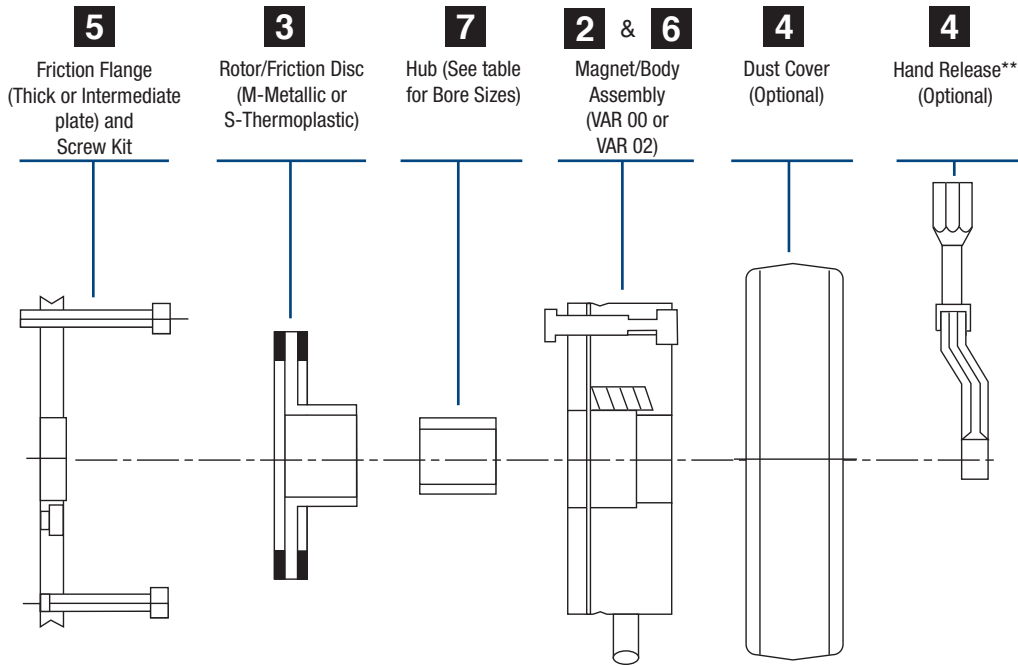
These units are designed for dry operation. The brake must be free from oil and grease. Exceeding the maximum rotation speed listed in the catalog will invalidate the guarantee.

* Coil voltages can vary slightly depending on unit size.



ERD Series Electrically Released Brakes

Product Configuration



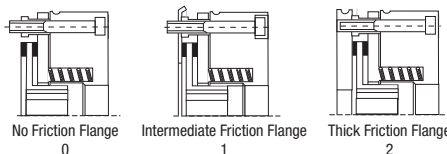
1 **Size:**
005, 010, 020, 035, 060, 100, 170, 300

2 **Variation:**
0 – VAR 00 – No torque adjustment
2 – VAR 02 – With central torque adjusting ring

3 **Friction Disc:**
M– Metallic carrier is standard
S– Thermoplastic carrier is available on sizes 5 & 10
H– High torque carrier available on sizes 060 through 300

4 **Options:**
0– None
1– Dust Cover
2– Hand Release**
3– Dust Cover and Hand Release

5 **Friction Flange and Screw Kits:**
0– No Friction Flange
1– Intermediate Friction Flange
2– Thick Friction Flange



Cable Std.

8 **Detection kit:**
0–None
1–With

7 **Bore Size:**
See Bore Size Table

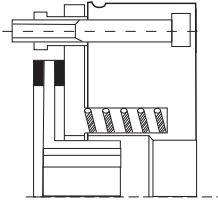
6 **Voltage:**
24 DC is standard
96, 103.5 (90)* & 207/215* DC are modifications

* Coil voltages can vary slightly depending on unit size.

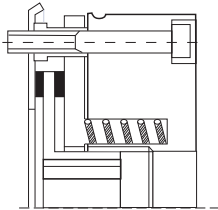
** Manual release available on variation 02 only.

ERD Series Electrically Released Bakes

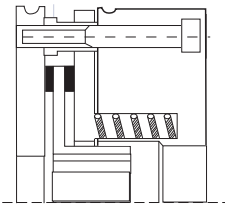
4 Mounting Options (by customer)



No Friction Flange
Requires long screw kit

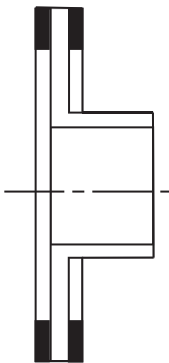


Intermediate Friction Flange
Requires long screw kit
Available on sizes 005 thru 035 only.



Thick Friction Flange (Standard)
Requires short screw kit

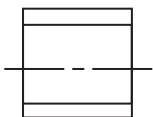
3 Rotor/Friction Disc



Available in two styles
M – Metallic (Standard)
S – Thermoplastic (Low inertia)
Sizes 005 & 010 only

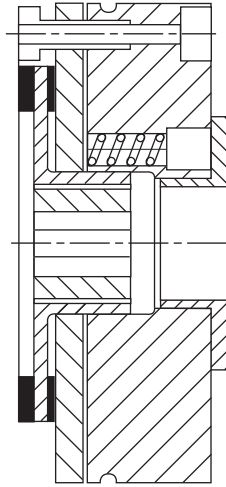
- Large thermoplastic bore hubs (Available in sizes 005 and 010 only)
- Large bore metallic disc (Available in sizes 005 thru 035)
- High torque metallic discs (Available in sizes 060 thru 300. Requires lower speed of rotation.)

7 Hub



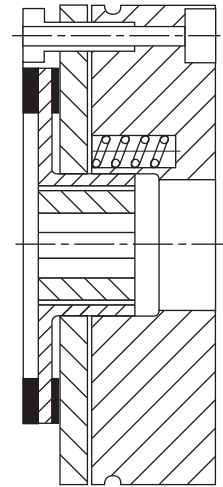
See Table for hub, bore and keyway size availability by ERD size.

2 Magnet Assembly Variations



VAR 02

- Torque reduction up to 50% by loosening one nut.
- Available in all sizes.
- Central nut has several “Detents” per turn allowing accurate torque adjustment.
- The brake is factory set at the minimum torque (50% of max. torque).

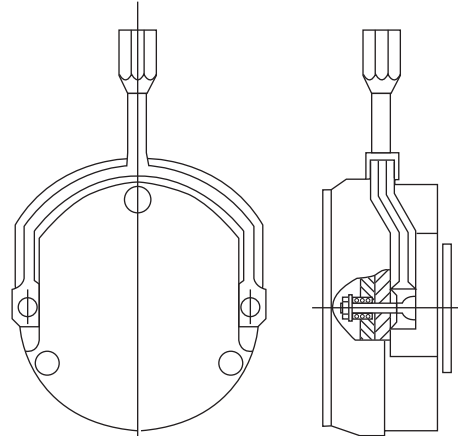


VAR 00

No torque adjustment possible

- Available in all sizes.
- No hand release option available.

4 Manual Release (Optional)



Automatically returns to “neutral position” when released, thereby restoring holding torque to the brake.

Designed to be retrofitted, except to VAR 00.

4 Dust Cover (Optional)

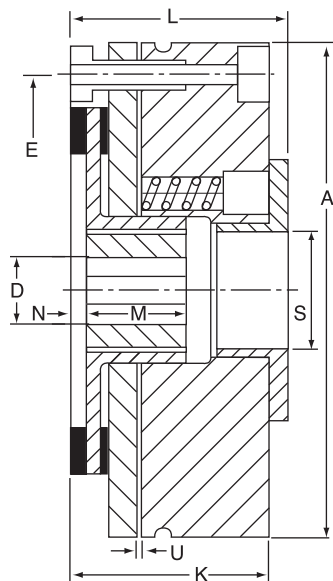
Available in all sizes.



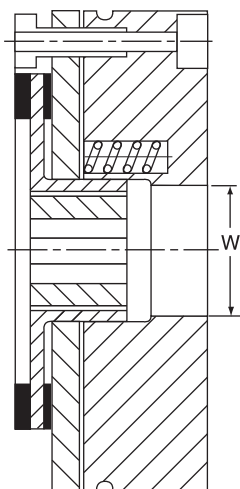
ERD Series Electrically Released Brakes

Brakes

VAR 02



VAR 00



Dimensions

All dimensions are nominal, unless otherwise noted.

| ERD Size | A | D Max. | E | K | L Max. | M +0.000/-0.008 |
|----------|----------------|---------------|----------------|-----------------|-----------------|-----------------|
| 5 | 3.307 (84) | 0.5 (12) | 2.835 (72) | 1.378 (35) | 1.575 (40) | 0.709 (18) |
| 10 | 4.016 (102) | 0.625 (15) | 3.543 (90) | 1.614 (41) | 1.831 (46.5) | 0.787 (20) |
| 20 | 5.000 (127) | 1.0 (24) | 4.409 (112) | 1.870 (47.5) | 2.185 (55.5) | 0.787 (20) |
| 35 | 5.787 (147) | 1.125 (28) | 5.197 (132) | 2.146 (54.5) | 2.559 (65) | 0.984 (25) |
| 60 | 6.378 (162) | 1.25 (32) | 5.709 (145) | 2.520 (64) | 2.933 (74.5) | 1.181 (30) |
| 100 | 7.402 (188) | 1.500 (41) | 6.693 (170) | 2.795 (71) | 3.209 (81.5) | 1.181 (30) |
| 170 | 8.465 (215) | 1.95 (50) | 7.717 (196) | 3.268 (83) | 3.780 (96) | 1.378 (35) |
| 300 | 9.921 (252) | 2.125 (54) | 9.055 (230) | 3.819 (97) | 4.528 (115) | 1.575 (40) |

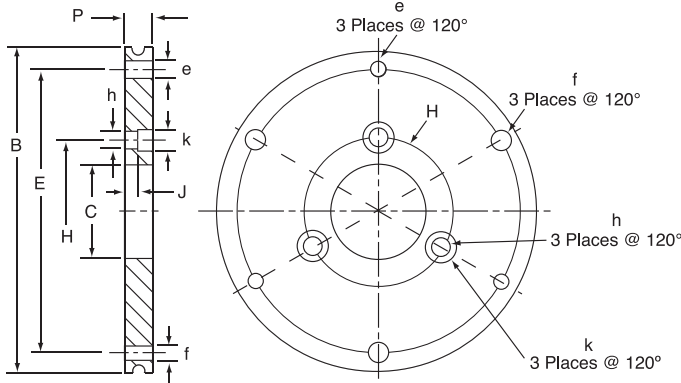
| ERD Size | N | S | U +/-0.002 | W |
|----------|----------------|---------------|----------------|-----------------|
| 5 | 0.079 (2) | 0.748 (19) | 0.008 (0.2) | 0.925 (23.5) |
| 10 | 0.118 (3) | 0.945 (24) | 0.008 (0.2) | 1.122 (28.5) |
| 20 | 0.157 (4) | 1.378 (35) | 0.008 (0.2) | 1.594 (40.5) |
| 35 | 0.118 (3) | 1.575 (40) | 0.012 (0.3) | 1.909 (48.5) |
| 60 | 0.118 (3) | 1.890 (48) | 0.012 (0.3) | 2.303 (58.5) |
| 100 | 0.118 (3) | 2.047 (52) | 0.012 (0.3) | 2.500 (63.5) |
| 170 | 0.177 (4.5) | 2.362 (60) | 0.012 (0.3) | 2.894 (73.5) |
| 300 | 0.197 (5) | 2.874 (73) | 0.012 (0.3) | 3.484 (88.5) |

1. Concentricity of field mounting pilot diameter with rotor mounting shaft within .006 T.I.R.
2. Squareness of field mounting face with rotor mounting shaft within .006 T.I.R. measured at field mounting bolt circle.
3. Rotor mounting shaft concentric with armature center of rotation within .006 T.I.R.
4. Armature hub pilot diameter to be concentric with armature center of rotation within .010 T.I.R.
5. If customer does not use a friction flange, the mating surface must be square to their mounting shaft within .006" and flat within .002".

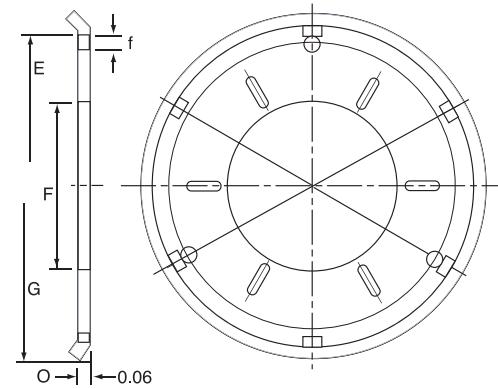
ERD Series Electrically Released Bakes

Friction Plates

Thick friction plate



Intermediate friction plate



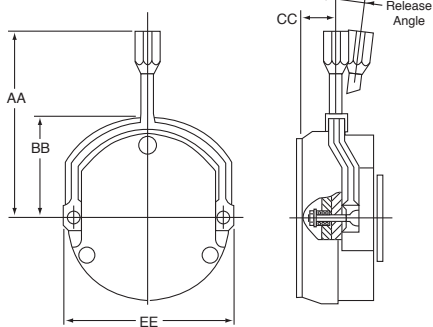
Dimensions

All dimensions are nominal, unless otherwise noted.

| ERD Size | B | C | E | e Bolt Pattern | f Bolt Clearance Holes | F | G | H | h | k Bolt Clearance Holes | J | P | O |
|----------|----------------|---------------|----------------|----------------|------------------------|---------------|------------------|----------------|-------------------|------------------------|--------------|---------------|----------------|
| 5 | 3.268 (83) | 0.787 (20) | 2.835 (72) | 3xM4 | 3x0.177 3(4.5) | 1.654 (42) | 3.425 (87) | 1.181 (30) | 3x0.177 (4.5) | 3x0.315 (8) | 0.079 (2) | | 0.125 (3.2) |
| 10 | 3.937 (100) | 1.181 (30) | 3.543 (90) | 3xM5 | 3x0.217 3(5.5) | 2.126 (54) | 4.213 (107) | 1.772 (45) | 3x0.217 (5.5) | 3x0.394 (10) | 0.079 (2) | | 0.125 (3.2) |
| 20 | 4.921 (125) | 1.575 (40) | 4.409 (112) | 3xM6 | 3x0.256 3(6.5) | 2.362 (60) | 5.217 (132.5) | 2.205 (56) | 3x0.260 (6.5) | 3x0.433 (11) | 0.118 (3) | | 0.141 (3.6) |
| 35 | 5.709 (145) | 1.772 (45) | 5.197 (132) | 3xM6 | 3x0.256 3(6.5) | 2.755 (70) | 6.004 (152.5) | 2.441 (62) | 3x0.260 (6.5) | 3x0.433 (11) | 0.118 (3) | | 0.181 (4.6) |
| 60 | 6.299 (160) | 2.165 (55) | 5.709 (145) | 3xM8 | 3x0.335 3(8.3) | | | 2.913 (74) | 3x0.327 (8.3) | 3x0.551 (14) | 0.118 (3) | 0.433 (11) | |
| 100 | 7.283 (185) | 2.559 (65) | 6.693 (170) | 3xM8 | 3x0.335 3(8.3) | | | 3.307 (84) | 3x0.327 (8.3) | 3x0.551 (14) | 0.118 (3) | 0.433 (11) | |
| 170 | 8.346 (212) | 2.953 (75) | 7.717 (196) | 6xM8 | 6x0.335 6(8.3) | | | 3.937 (100) | 3x0.327 (8.3) | 6x0.551 (14) | 0.118 (3) | 0.433 (11) | |
| 300 | 9.843 (250) | 3.543 (90) | 9.055 (230) | 6xM10 | 6x0.413 6(10.3) | | | 4.724 (120) | 3x0.406 (10.3) | 6x0.670 (17) | 0.118 (3) | 0.433 (11) | |

The thick mounting flange provides the proper material and mounting tolerances for the brake. The intermediate mounting flange provides the proper material in applications where flatness, squareness and concentricity requirements are met on the machine already.

Manual Release



| ERD Size | AA | BB | CC | DD | EE | Release Angle |
|----------|----------------|---------------|--------------|---------------|------------------|---------------|
| 5 | 3.86 (98) | 2.09 (53) | 0.67 (17) | 3.46 (88) | 3.46 (88) | 10° |
| 10 | 4.21 (107) | 2.44 (62) | 0.71 (18) | 4.17 (106) | 4.17 (106) | 9° |
| 20 | 5.08 (129) | 2.99 (76) | 0.98 (25) | 5.20 (132) | 5.20 (132) | 8° |
| 35 | 5.47 (139) | 3.39 (86) | 0.87 (22) | 5.98 (152) | 5.98 (152) | 8° |
| 60 | 7.44 (189) | 4.09 (104) | 1.57 (40) | 6.53 (166) | 6.54 (166) | 15° |
| 100 | 8.07 (205) | 4.72 (120) | 1.73 (44) | 7.56 (192) | 7.36 (187) | 15° |
| 170 | 9.45 (240) | 5.51 (140) | 2.09 (53) | 8.62 (219) | 8.78 (228) | 15° |
| 300 | 12.32 (313) | 6.38 (162) | 2.40 (61) | 10.8 (256) | 10.33 (262.5) | 20° |

Dust Cover



ERD Series Electrically Released Brakes

How To Order

Hub Bore and Keyway Sizes

U.S. English

| Bore in. | Keyway | | Available Bores | | | | | | | |
|-------------|--------|-------|-----------------|---------|------------|--------------|------|------|------|------|
| | Width | Depth | 5 | 10 | 20 | 35 | 60 | 100 | 170 | 300 |
| 3/8 | 3/32 | 3/64 | Std. | | | | | | | |
| 1/2 | 1/8 | 1/16 | * | Std. | Std. | | | | | |
| 5/8 | 3/16 | 3/32 | *(Max.) | * | Std. | Std. | Std. | Std. | | |
| 3/4 | 3/16 | 3/32 | | *(Max.) | Std. | Std. | | | | |
| 7/8 | 3/16 | 3/32 | | | Std.(Max.) | Std. | | | Std. | |
| 1 | 1/4 | 1/8 | | | *(Max.) | Std. | Std. | Std. | | Std. |
| 1-3/8 | 5/16 | 5/32 | | | | *(1-1/8Max.) | | Std. | Std. | Std. |
| 1-3/4 | 3/8 | 3/16 | | | | | | | Std. | Std. |

Metric

| Bore (mm) | Keyway | | Available Bores | | | | | | | |
|--------------|--------|-------|-----------------|-----------|-----------|-----------|----------|------|------|-----------|
| | Width | Depth | 5 | 10 | 20 | 35 | 60 | 100 | 170 | 300 |
| 8 | | | P.B. | | | | | | | |
| 10 | | | Std. | P.B. | P.B. | | | | | |
| 11 | 4 | 2 | Std. | Std. | Std. | | | | | |
| 14 | 5 | 2.5 | * | Std. | Std. | P.B. | P.B. | | | |
| 15 | 5 | 2.5 | * | | Std. | Std. | | P.B. | | |
| 18 | | | | * | Std. | Std. | | | | |
| 20 | 6 | 3 | | *(20Max.) | Std. | Std. | | | P.B. | |
| 22 | 6 | 3 | | | Std. | Std. | | | | |
| 24 | 8 | | | | * | Std. | | | | |
| 25 | 8 | 3.5 | | | | Std. | Std. | Std. | | P.B. |
| 28 | 8 | 3.5 | | | *(28Max.) | * | | | | |
| 30 | 8 | 3.5 | | | | *(32Max.) | Std. | Std. | | |
| 35 | 10 | 4 | | | | | (32Max.) | Std. | Std. | Std. |
| 40 | 12 | 4 | | | | | | Max. | Std. | Std. |
| 45 | 14 | 4.5 | | | | | | | Std. | Std. |
| 50 | 14 | 4.5 | | | | | | | Max. | (54 Max.) |

P.B. = Pilot Bore, * = Large Bore Hub, which requires use of a large bore friction disc.

Design Considerations/Limitations

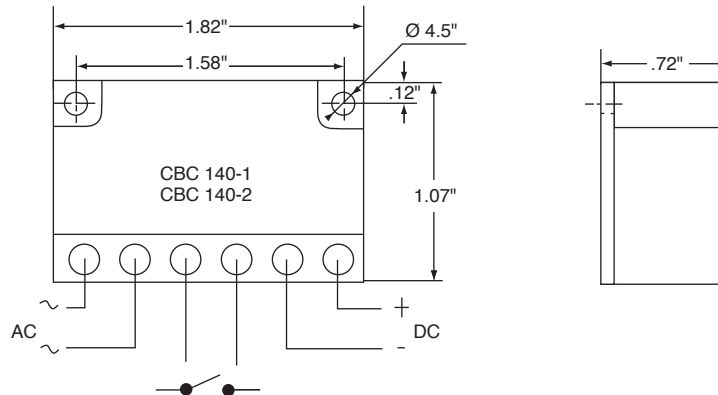
1. Check the airgap periodically and reset as required per instructions found on page 4 of the service manual P-229. Inspection interval(s) depend on the frequency of brake application.
2. Check friction material thickness periodically per dimension N (see page 127) and replace when below the minimum shown below.

Inches (mm) millimeters

| ERD Size | 5 | 10 | 20 | 35 | 60 | 100 | 170 | 300 |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Min. | 0.009 | 0.008 | 0.012 | 0.009 | 0.010 | 0.010 | 0.012 | 0.013 |
| Thickness | (0.22) | (0.21) | (0.31) | (0.22) | (0.24) | (0.24) | (0.31) | (0.32) |

ERD Control Units

Dimensions

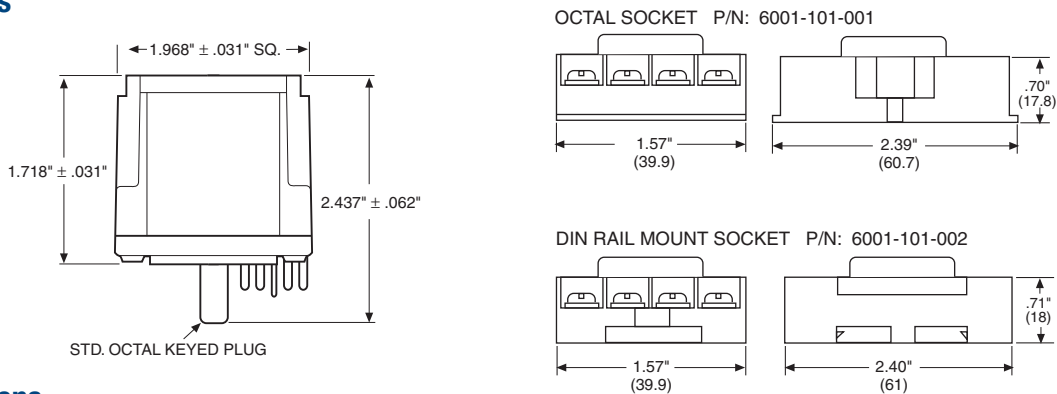


Specifications

| | CBC-141-1 | CBC-141-2 | | |
|------------------|------------|------------|-------|-----|
| Part Number | ACG830A1P1 | ACG830A1P2 | | |
| Frequency (Hz) | 50/60 | 50/60 | | |
| Input Voltage | 230 VAC | 30 | 115 | 230 |
| Output Voltage | 103.5 VDC | 24 | 103.5 | 207 |
| Max. Current (A) | 1 | 2 | 2 | 2 |

CBC-141-1: Supply unit with single wave rectification for low current.
 CBC-141-2: Supply unit with dual wave rectification for low current.

Dimensions

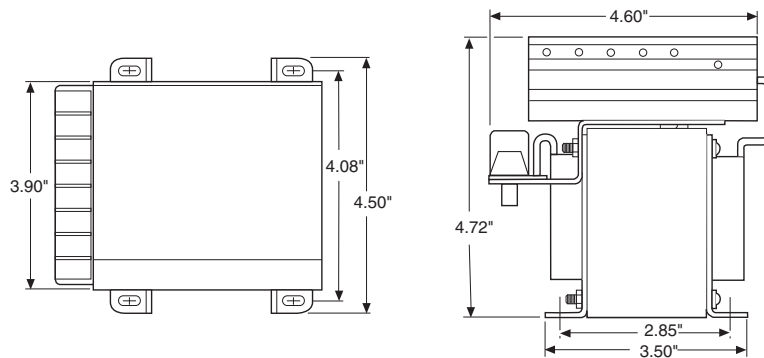


Specifications

| | CBC-801-1 | CBC-801-2 |
|---------------------|--|-------------------------------|
| Part No. | 6001-448-004 | 6001-448-006 |
| Input Voltage | 120 VAC, 50/60 Hz | 220/240 VAC, 50/60 Hz |
| Output Voltage | 90 VDC, 1.25 A max. | 90 VDC, 1.25 A max. |
| Circuit Protection | Fused 1.6 Amp, 250 V fast-blo | Fused 1.6 Amp, 250 V fast-blo |
| Ambient Temperature | -23° to 116°F (-31° to 47°C) | |
| Max. Cycle Rate | Limited by the clutch or brake, variable with application | |
| Switching | Single pole, double throw Minimum contact rating: 10 Amp, 28 VDC resistive or 10 Amp, 120 VAC inductive | |
| Status Indicator | Red LED indicates brake is energized, Green LED indicates clutch is energized | |
| Mounting | Two versions of octal socket are available: 6001-101-001 foot mount 6001-101-002 DIN rail mount | |

All dimensions nominal unless otherwise specified.

Dimensions



Specifications

| | CBC-450-90 | CBC-450-24 |
|---------------------|---|---|
| Part No. | 6006-448-006 | 6006-448-005 |
| Input Voltage | 120/220/240/380/480 VAC | 120/220/240/380/480 VAC |
| Output Voltage | 90 VDC | 24 VDC |
| Output Current | 1 Amp/Channel 1.2 Amps Total | 4 Amps/Channel 4 Amps Total |
| Auxiliary Supply | 12 VDC 250 mA | 12 VDC 250 mA |
| Circuit Protection | Fused 1.5 Amp | Fused 5 Amp |
| Ambient Temperature | +32° to 122°F (0° to 50°C) | +32° to 122°F (0° to 50°C) |
| Status Indicators | Red LED indicates channel is energized. | Red LED indicates channel is energized. |
| Adjustments | Jumper for single or dual operation. | Jumper for single or dual operation. |
| Inputs | 3 Optically isolated, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (E-stop). | 3 Optically isolated, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (E-stop). |

ERD Series Electrically Released Brakes

1 ERD005

| Description | Part Number |
|--|---------------|
| 2 & 6 Variation 00 – 24 VDC | G5UE005A01P1 |
| Variation 00 – 103.5 VDC | G5UE005A01P2 |
| Variation 00 – 207 VDC | G5UE005A01P3 |
| Variation 02 – 24 VDC | G5UE005A21P1 |
| Variation 02 – 103.5 VDC | G5UE005A21P2 |
| Variation 02 – 207 VDC | G5UE005A21P3 |
| 3 Friction Disc | |
| Standard Synthetic Disc | A5UE005B1P1 |
| Large Bore Synthetic Disc | A5UE005B3P1 |
| Standard Metallic Disc | A5UE005B9P1 |
| Large Bore Metallic Disc | A5UE005B8P1 |
| 4 Options | |
| Hand Release | A5UE005K1P1 |
| Dust Cover | A5UE005C4P1 |
| 5 Friction Flange & Screw Kit | |
| Intermediate Flange | A5UE005C309P2 |
| Thick Flange | A5UE005C301P1 |
| Short Screw | A5UE005K2P1 |
| Long Screw | A5UE005K2P2 |
| 7 Hub Bore size | |
| Hub Pilot Bore – 8MM | A5UE005C500P1 |
| Hub Bored W/Keyway – 11MM | A5UE005C500P2 |
| Hub Bored W/Keyway – 10MM | A5UE005C500P5 |
| Hub Bored W/O Keyway – 10MM | A5UE005C500P6 |
| Hub Bored W/Keyway – 3/8" | A5UE005C500P9 |
| Large Bore Hub W/Keyway – 1/2" | A5UE005C503P6 |
| Large Bore Hub W/Keyway - 5/8" | A5UE005C503P5 |
| 8 Detection Kit | V4NST7 |

1 ERD010

| Description | Part Number |
|--|-----------------|
| 2 & 6 Variation-00 – 24 VDC | G5UE010A01P1 |
| Variation-00 – 103.5 VDC | G5UE010A01P2 |
| Variation-00 – 207 VDC | G5UE010A01P3 |
| Variation 02 – 24 VDC | G5UE010A21P1 |
| Variation 02 – 103.5 VDC | G5UE010A21P2 |
| Variation 02 – 207 VDC | G5UE010A21P3 |
| 3 Friction Disc | |
| Standard Synthetic Disc | A5UE010B1P1 |
| Large Bore Synthetic Disc | A5UE010B3P1 |
| Standard Metallic Disc | A5UE010B9P1 |
| Large Bore Metallic Disc | A5UE010B15P1 |
| 4 Options | |
| Hand Release | A5UE010K1P1 |
| Dust Cover | A5UE010C4P1 |
| 5 Friction Flange & Screw Kit | |
| Intermediate Flange | A5UE010C312P2 |
| Thick Flange | A5UE010C301P1 |
| Short Screw | A5UE010K2P1 |
| Long Screw | A5UE010K2P2 |
| 7 Hub Bore size | |
| Pilot Bore – 10MM | A5UE010C500P1 |
| Hub Bored W/Keyway – 1/2" | A5UE010C500P13 |
| Large Bore Hub W/Keyway – 5/8" | consult factory |
| Large Bore Hub W/Keyway - 3/4" | consult factory |
| 8 Detection Kit | V4NST7 |

1 ERD020

| Description | Part Number |
|--|-----------------|
| 2 & 6 Variation 00 – 24 VDC | G5UE020A01P1 |
| Variation 00 – 103.5 VDC | G5UE020A01P2 |
| Variation 00 – 207 VDC | G5UE020A01P3 |
| Variation 02 – 24 VDC | G5UE020A21P1 |
| Variation 02 – 103.5 VDC | G5UE020A21P2 |
| Variation 02 – 207 VDC | G5UE020A21P3 |
| 3 Friction Disc | |
| Standard Synthetic Disc | N/A |
| Large Bore Synthetic Disc | N/A |
| Standard Metallic Disc | A5UE020B9P1 |
| Large Bore Metallic Disc | A5UE020B3P1 |
| 4 Options | |
| Hand Release | A5UE020K1P1 |
| Dust Cover | A5UE020C4P1 |
| 5 Friction Flange & Screw Kit | |
| Intermediate Flange | A5UE020C308P2 |
| Thick Flange | A5UE020C301P1 |
| Short Screw | A5UE020K2P1 |
| Long Screw | A5UE020K2P2 |
| 7 Hub Bore size | |
| Pilot Bore – 10MM | A5UE020C500P1 |
| Hub Bored W/Keyway – 15MM | A5UE020C500P2 |
| Hub Bored W/Keyway – 20MM | A5UE020C500P3 |
| Hub Bored W/Keyway – 11MM | A5UE020C500P6 |
| Hub Bored W/Keyway – 14MM | A5UE020C500P7 |
| Hub Bored W/Keyway – 1/2" | A5UE020C500P15 |
| Hub Bored W/Keyway – 5/8" | A5UE020C500P16 |
| Hub Bored W/Keyway – 3/4" | A5UE020C500P17 |
| Hub Bored W/Keyway – 7/8" | A5UE020C500P18 |
| Large Bore Hub W/Keyway - 1" | consult factory |
| 8 Detection Kit | V4NST7 |

1 ERD035

| Description | Part Number |
|--|----------------|
| 2 & 6 Variation-00 – 24 VDC | G5UE035A01P1 |
| Variation-00 – 103.5 VDC | G5UE035A01P2 |
| Variation-00 – 207 VDC | G5UE035A01P3 |
| Variation 02 – 24 VDC | G5UE035A21P1 |
| Variation 02 – 103.5 VDC | G5UE035A21P2 |
| Variation 02 – 207 VDC | G5UE035A21P3 |
| 3 Friction Disc | |
| Standard Synthetic Disc | N/A |
| Large Bore Synthetic Disc | N/A |
| Standard Metallic Disc | A5UE035B2P1 |
| Large Bore Metallic Disc | A5UE035B5P1-NM |
| 4 Options | |
| Hand Release | A5UE035K1P1 |
| Dust Cover | 642-0013 |
| 5 Friction Flange & Screw Kit | |
| Intermediate Flange | A5UE035C311P2 |
| Thick Flange | A5UE035C301P1 |
| Short Screw | A5UE035K2P1 |
| Long Screw | A5UE035K2P2 |
| 7 Hub Bore size | |
| Pilot Bore Hub – 14MM | A5UE035C500P1 |
| Hub Bored W/Keyway – 20MM | A5UE035C500P2 |

ERD Series Electrically Released Brakes

| | |
|----------------------------------|-----------------|
| Hub Bored W/Keyway – 25MM | A5UE035C500P3 |
| Hub Bored W/Keyway – 15MM | A5UE035C500P7 |
| Hub Bored W/Keyway – 5/8" | A5UE035C503P1 |
| Hub Bored W/Keyway – 3/4" | A5UE035C503P3 |
| Hub Bored W/Keyway – 7/8" | A5UE035C503P4 |
| Hub Bored W/Keyway – 1" | A5UE035C503P2 |
| Large Bore Hub W/Keyway - 1-1/8" | consult factory |

| | | |
|------------------------|-----------|------------|
| 8 Detection Kit | V4NST7 | |
| Rectifiers | | |
| Half Wave | MCS-141-1 | ACG830A1P1 |
| Full Wave | MCS-141-2 | ACG830A1P2 |

1 ERD060

| Description | Part Number |
|--|-------------|
| 2 & 6 Variation 00 – 24 VDC | BT212094250 |
| Variation 00 – 103.5 VDC | BT212094251 |
| Variation 00 – 207 VDC | BT212094252 |
| Variation 02 – 24 VDC | BT212094246 |
| Variation 02 – 103.5 VDC | BT212094247 |
| Variation 02 – 207 VDC | BT212094248 |

| | |
|-------------------------------------|-------------|
| 3 Friction Disc | |
| Standard Metallic Friction Disc (M) | BT212094481 |
| Metallic Friction Disc (HT) | BT212094185 |

| | |
|------------------|-------------|
| 4 Options | |
| Dust Cover | BT312026932 |
| Hand Release | BT212094492 |

| | |
|--|-------------|
| 5 Friction Flange & Screw Kit | |
| Thick Friction Plate | BT312026917 |
| Short Screw (for Thick Friction Plate) | BT212094220 |
| Long Screw (for No Friction Plate) | BT212094221 |

| | |
|---------------------------|-------------|
| 7 Hub Bore Size | |
| Pilot Bore Hub – 14MM | BT312026935 |
| Hub Bored W/Keyway – 25MM | BT312026936 |
| Hub Bored W/Keyway – 30MM | BT312026937 |
| Hub Bored W/Keyway – 5/8" | BT312028396 |
| Hub Bored W/Keyway – 1" | BT312028397 |

| | |
|------------------------|-------------|
| 8 Detection Kit | BT212095409 |
|------------------------|-------------|

1 ERD100

| Description | Part Number |
|--|-------------|
| 2 & 6 Variation 00 – 24 VDC | BT212094258 |
| Variation 00 – 103.5 VDC | BT212094259 |
| Variation 00 – 207 VDC | BT212094260 |
| Variation 02 – 24 VDC | BT212094254 |
| Variation 02 – 103.5 VDC | BT212094255 |
| Variation 02 – 207 VDC | BT212094256 |

| | |
|-------------------------------------|-------------|
| 3 Friction Disc | |
| Standard Metallic Friction Disc (M) | BT212094497 |
| Metallic Friction Disc (HT) | BT212094186 |

| | |
|------------------|-------------|
| 4 Options | |
| Dust Cover | BT312026934 |
| Hand Release | BT212094508 |

| | |
|--|-------------|
| 5 Friction Flange & Screw Kit | |
| Thick Friction Plate | BT312026928 |
| Short Screw (for Thick Friction Plate) | BT212094223 |
| Long Screw (for No Friction Plate) | BT212094224 |

| | |
|---------------------------|-------------|
| 7 Hub Bore Size | |
| Pilot Bore Hub – 15MM | BT312026938 |
| Hub Bored W/Keyway – 25MM | BT312026939 |
| Hub Bored W/Keyway – 30MM | BT312026940 |

| | |
|-----------------------------|-------------|
| Hub Bored W/Keyway – 35MM | BT312026941 |
| Hub Bored W/Keyway – 5/8" | BT312028398 |
| Hub Bored W/Keyway – 1" | BT312028398 |
| Hub Bored W/Keyway – 1-3/8" | BT312028400 |

| | |
|------------------------|-------------|
| 8 Detection Kit | BT212095409 |
|------------------------|-------------|

1 ERD170

| Description | Part Number |
|--|-------------|
| 2 & 6 Variation 00 – 24 VDC | BT212094358 |
| Variation 00 – 103.5 VDC | BT212094359 |
| Variation 00 – 207 VDC | BT212094360 |
| Variation 02 – 24 VDC | BT212094355 |
| Variation 02 – 103.5 VDC | BT212094356 |
| Variation 02 – 207 VDC | BT212094357 |

| | |
|-------------------------------------|-------------|
| 3 Friction Disc | |
| Standard Metallic Friction Disc (M) | BT212094448 |
| Metallic Friction Disc (HT) | BT212094329 |

| | |
|------------------|-------------|
| 4 Options | |
| Dust Cover | BT312027158 |
| Hand Release | BT212094522 |

| | |
|--|-------------|
| 5 Friction Flange & Screw Kit | |
| Thick Friction Plate | BT312027135 |
| Short Screw (for Thick Friction Plate) | BT212094350 |
| Long Screw (for No Friction Plate) | BT212094351 |

| | |
|-----------------------------|-------------|
| 7 Hub Bore Size | |
| Pilot Bore Hub – 20MM | BT312027150 |
| Hub Bored W/Keyway – 35MM | BT312027151 |
| Hub Bored W/Keyway – 40MM | BT312027152 |
| Hub Bored W/Keyway – 45MM | BT312027153 |
| Hub Bored W/Keyway – 7/8" | BT312028401 |
| Hub Bored W/Keyway – 1-3/8" | BT312028402 |
| Hub Bored W/Keyway – 1-3/4" | BT312028403 |

| | |
|------------------------|-------------|
| 8 Detection Kit | BT212095409 |
|------------------------|-------------|

1 ERD300

| Description | Part Number |
|--|-------------|
| 2 & 6 Variation 00 – 24 VDC | BT212094364 |
| Variation 00 – 103.5 VDC | BT212094365 |
| Variation 00 – 207 VDC | BT212094366 |
| Variation 02 – 24 VDC | BT212094361 |
| Variation 02 – 103.5 VDC | BT212094362 |
| Variation 02 – 207 VDC | BT212094363 |

| | |
|-------------------------------------|-------------|
| 3 Friction Disc | |
| Standard Metallic Friction Disc (M) | BT212094449 |
| Metallic Friction Disc (HT) | BT212094334 |

| | |
|------------------|-------------|
| 4 Options | |
| Dust Cover | BT312027159 |
| Hand Release | BT212094536 |

| | |
|--|-------------|
| 5 Friction Flange & Screw Kit | |
| Thick Friction Plate | BT312027146 |
| Short Screw (for Thick Friction Plate) | BT212094353 |
| Long Screw (for No Friction Plate) | BT212094354 |

| | |
|-----------------------------|-------------|
| 7 Hub Bore Size | |
| Pilot Bore Hub – 25MM | BT312027154 |
| Hub Bored W/Keyway – 35MM | BT312027155 |
| Hub Bored W/Keyway – 40MM | BT312027156 |
| Hub Bored W/Keyway – 45MM | BT312027157 |
| Hub Bored W/Keyway – 1" | BT312028404 |
| Hub Bored W/Keyway – 1-3/8" | BT312028405 |
| Hub Bored W/Keyway – 1-3/4" | BT312028406 |

| | |
|------------------------|-------------|
| 8 Detection Kit | BT212095409 |
|------------------------|-------------|

Permanent Magnet Electrically Released Brakes

Permanent Magnet Brakes

Frequent cycling applications which regularly engage the brake to stop a moving load call for FB or ER models. Frequent cycling keeps working surfaces burnished and operating at top efficiency. The convenience of power off braking combines with stopping capability in the event of power failure to provide the ideal brake for many applications.

FB Series (Shaft Mounted)



FB Series permanent magnet brakes are offered as off-the-shelf, pre-assembled packages in three sizes. Packaged products are easy to install.

ER Series (Flange Mounted)

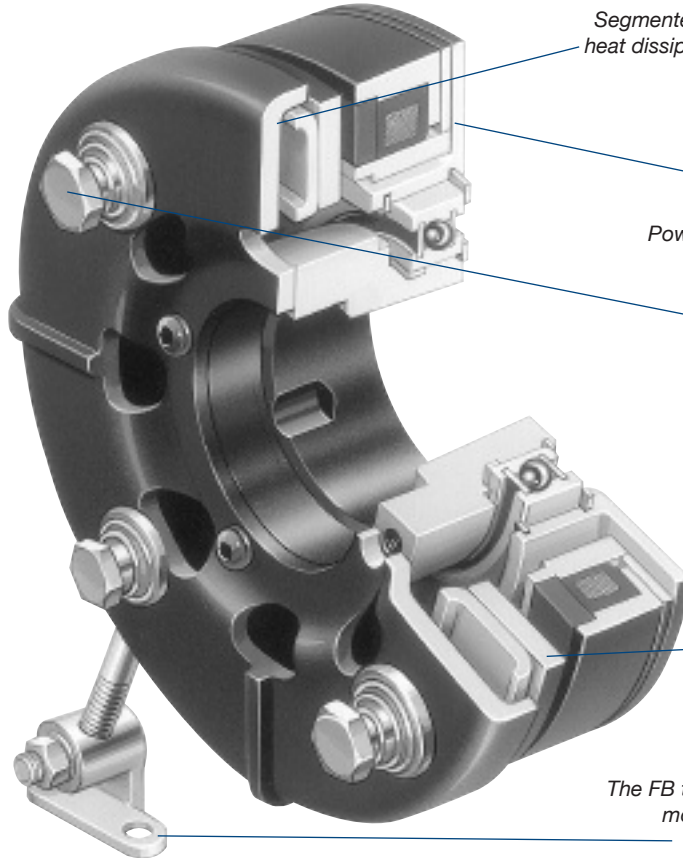


ER Series permanent magnet brakes allow customers added flexibility and larger sizes. 825 and 1225 are available in both standard and heavy duty models.

Principle of Operation

Electrically Released Brakes automatically engage when the power goes off. Reliable permanent magnets provide a permanent holding force. Electrical power applied to the coil nullifies the attraction of the permanent magnet and the brake releases. No power is required to stop or hold a load.

Packaged Convenience for Power Off Applications



Long Life – High Cycle Rates

Segmented armature provides high heat dissipation and long service life. Capable of rapid cycling.

High Torque

Powerful permanent magnets.

Autogap™

Automatic wear adjust.

Electrically Released

Brake automatically engages when power is turned off– releases when power is applied.

Mounting Flexibility

The FB torque arm feature permits mounting on any shaft. Wide range of shaft sizes.

FB Magnetically Set, Electrically Released, Dynamic Engagement Brake

Packaged brake assembly complete with conduit box is ready to install.

This brake must be engaged while the shaft is in motion. Shaft speed should be 100 RPM or greater when the brake is engaged. This style brake offers quick and easy bearing mounting on the shaft, high cycle rate capability, and excellent life.

FB Brake on double shaft motor.



Features

- Designed for dynamic stopping operations
- Brake automatically engages when power is turned off
- High cycle rate capability
- Never needs adjustment – automatically compensates for wear
- Mounting flexibility
- Powerful permanent magnets
- Segmented armature design provides high heat dissipation and long service life.
- Complete controllability for soft stops.
- UL listed

FB Series Electrically Released Brakes

Selection/Ordering Information

Selection Procedure

FB (Shaft Mounted) Series brakes are available in three models to provide an optimum size to match your application requirements. Static torque capabilities range from 10.5 lb.ft. to 56 lb.ft.

1. Verify that the brake will be cycled frequently in normal operation.
2. Determine the horsepower and speed at the brake location.
3. The correct size Electrically Released Brake is shown at the intersection of the HP and shaft speed on the chart below.
4. Available bore sizes are listed in the bore data chart. When ordering, specify voltage and bore size.
5. Five motor adapters are also available for mounting Electrically Released Brakes on single shaft extension motors (see motor adapter bore size chart on page 136). For double shaft extension motors, the adapter can be eliminated. Specify motor shaft size.

How to Order

1. Specify brake part number.
2. For FB-475 and FB-650, order bushing separately (see page 139). FB-375 does not require a bushing.
3. For single shaft motor mounting, order adapter separately (Item 2 below). Specify the following bore size for the FB brake. This is the bore size required for mounting the electrically released brake on the end of the motor adapter.
 FB-375 5/8" bore
 FB-475 1 bore
 FB-650 1-3/8" bore
4. See the Controls Section for controls. FB Series brakes require a control with a potentiometer to vary brake channel output.

CBC-200, 300 or 500/550 are recommended.

Horsepower vs. Shaft Speed*

| HP | SHAFT SPEED AT BRAKE (IN RPM)* | | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 |
| 1/12 | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | |

* For applications which require stopping below 100 RPM, consult factory.

Specifications

| Model | Voltage DC | Static Torque (lb.ft.) | Max. RPM | Total Weight (lbs.) |
|--------|------------|------------------------|----------|---------------------|
| FB-375 | 24V 90V | 10.5 | 5000 | 4.5 |
| FB-475 | 24V 90V | 21 | 4500 | 6.3 |
| FB-650 | 24V 90V | 56 | 3600 | 13.2 |

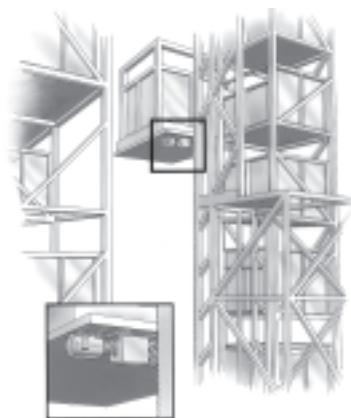
Electrically Released Brake Assemblies

| Unit Size | Bore | Voltage DC | Part Number |
|-----------|------|------------|--------------|
| FB-375 | 1/2" | 24 | 5390-170-024 |
| FB-375 | 1/2" | 90 | 5390-170-021 |
| FB-375 | 5/8" | 24 | 5390-170-023 |
| FB-375 | 5/8" | 90 | 5390-170-022 |
| FB-475 | — | 24 | 5391-170-012 |
| FB-475 | — | 90 | 5391-170-009 |
| FB-650 | — | 24 | 5392-170-010 |
| FB-650 | — | 90 | 5392-170-007 |

Typical Application

Storage Elevator

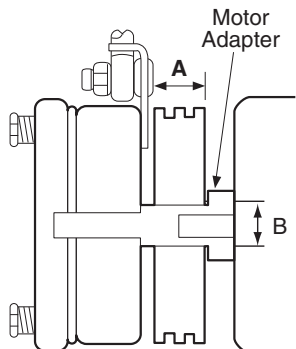
These brakes will stop as well as keep a load in position until they are electrically released. They are also used as emergency stopping devices.



Permanent Magnet Electrically Released Brakes

Motor and Shaft Adapters

Motor Adapter Bore Sizes

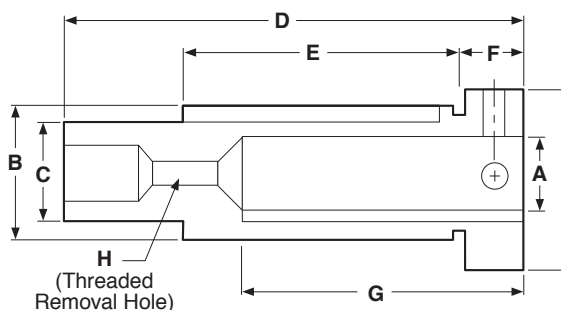


| Model Size | Motor Shaft Size | A Usable Length | B Dia. | When using an adapter order the following | |
|------------|------------------|-----------------|--------|---|---------------|
| | | | | Adapter | Dodge Bushing |
| 375 | .625 | 2.000 | .875 | 5380-101-005 | *None |
| | .875 | 2.250 | 1.250 | 5380-101-004 | *None |
| 475 | 1.125 | 2.750 | 1.625 | 5381-101-003 | #1008 1" |
| 650 | 1.375 | 3.000 | 2.000 | 5382-101-003 | #1310 1.375" |
| | 1.625 | 3.625 | 2.250 | 5382-101-002 | #1310 1.375" |

*Order FB-375 with 5/8" bore.

FB Shaft Adapter

Shown below are dimensions and specifications for the optional shaft adapter available for mounting FB Series brakes on a motor. A standard sheave, pulley, or sprocket, with either a tapered bushing or straight bore, can be installed on the shaft adapter. The brake is mounted on the end of the shaft adapter and the complete assembly fits onto the motor shaft, secured with setscrews. Fitting the belts or chain and torque arm completes the installation.

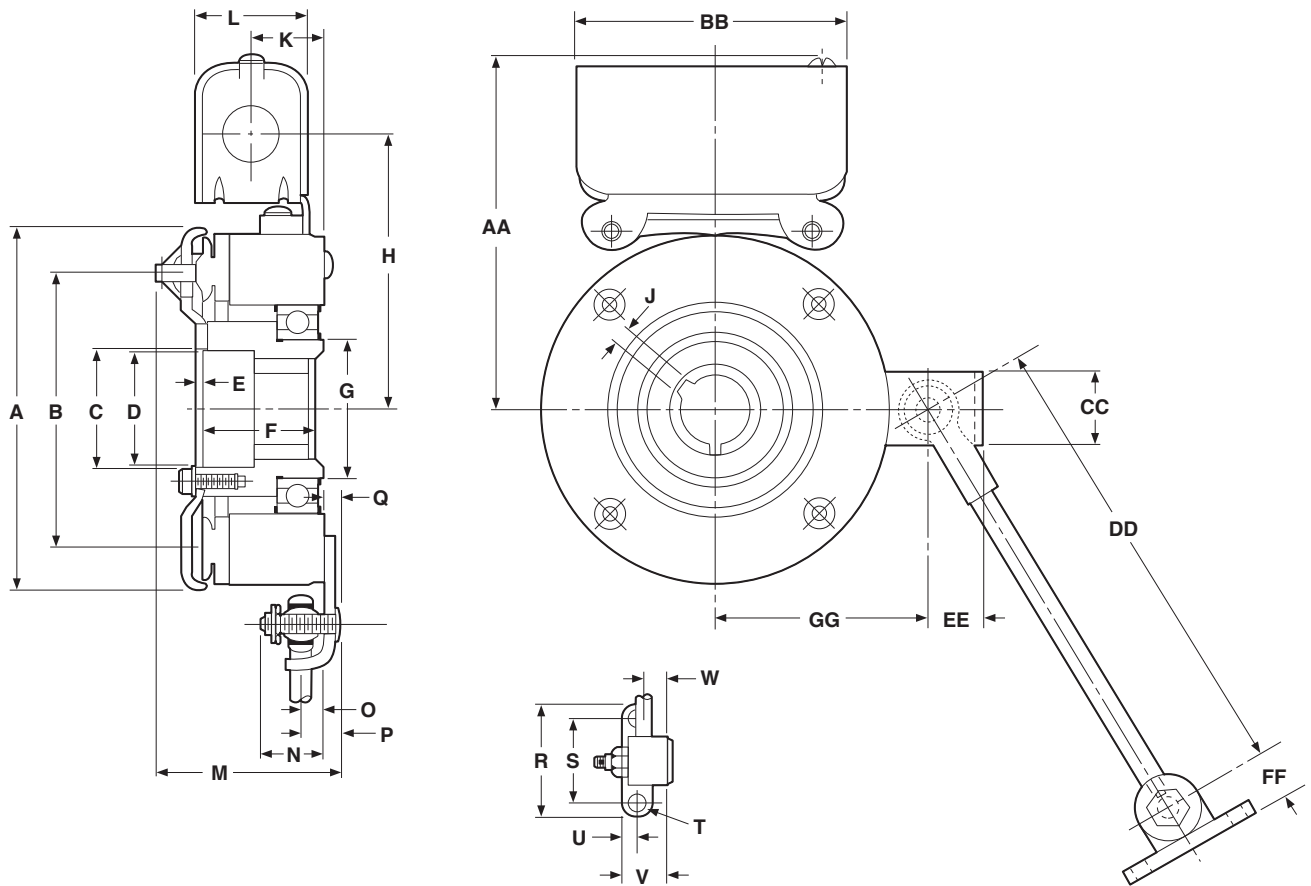


| Model | A | Kwy. | B | Kwy. | Key Part No. | C | Kwy. | Key Part No. | Dodge Bushing Size | D | E | F | G | H | I |
|--------|-------|-------------|-------|-------------|--------------|-------|-------------|--------------|--------------------|----------------|-------|--------------|-------|---------------|-------|
| FB-375 | 5/8 | 3/16 x 3/32 | 7/8 | 3/16 x 3/32 | 590-0016 | 5/8 | 3/16 x 3/32 | 590-0043 | None | 4.391 4.359 | 2 | .391 .359 | 2 | 1/4-20 UNC | 1.125 |
| FB-375 | 7/8 | 3/16 x 3/32 | 1-1/4 | 1/4 x 1/8 | 590-0022 | 5/8 | 3/16 x 3/32 | 590-0043 | None | 4.578 4.742 | 2-1/4 | .516 .484 | 2-1/4 | 1/4-20 UNC | 1.500 |
| FB-475 | 1-1/8 | 1/4 x 1/8 | 1-5/8 | 3/8 x 3/16 | 590-0041 | 1 | 1/4 x 1/8 | — | #1008 1" | 4.516 4.484 | 2-3/4 | .641 .609 | 2-3/4 | 1/2-13 UNC | 1.750 |
| FB-650 | 1-3/8 | 5/16 x 5/32 | 2 | 1/2 x 1/4 | 590-0042 | 1-3/8 | 5/16 x 5/32 | 590-0044 | #1310 1-3/8" | 5.547 5.515 | 3-3/8 | .641 .609 | 3-3/8 | 1/2-13 UNC | 2.125 |
| FB-650 | 1-5/8 | 3/8 x 3/16 | 2-1/4 | 1/2 x 1/4 | 590-0042 | 1-3/8 | 5/16 x 5/32 | 590-0044 | #1310 1-3/8" | 6.172 6.140 | 4 | .641 .609 | 4 | 1/2-13 UNC | 2.375 |

All dimensions are nominal unless otherwise noted.

FB Series Electrically Released Brakes

FB-375, FB-475, FB-650



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Dia. | C Min. | D Dia. | E Min. | F | G Dia. | H | J Dia. | K | L | M Max. | N | O | P |
|------|-----------|-----------|-----------|-----------|-----------|-------|-----------|-------|-----------|-------|-------|-----------|-------|------|------|
| 375 | 4.078 | 3.125 | .7505 | — | .031 | 1.906 | 1.375 | 3.359 | .187 | 1.281 | 1.546 | 2.716 | .843 | .281 | .531 |
| 475 | 5.171 | 4.000 | 1.663 | 1.593 | — | 1.875 | 1.781 | 3.875 | — | 1.218 | 1.546 | 3.390 | 1.093 | .312 | .531 |
| 650 | 6.578 | 5.125 | 2.343 | 2.281 | — | 2.250 | 2.562 | 4.800 | — | 1.550 | 1.546 | 3.765 | 1.031 | .343 | .640 |

| Size | Q Max. | R | S Dia. | T | U | V | W | AA Max. | BB | CC | DD | EE | FF | GG |
|------|-----------|-------|-----------|------|--------------|------|------|------------|-------|-------|--------|------|------|-------|
| 375 | — | 2.000 | 1.500 | .270 | .270 .260 | .781 | .359 | 4.468 | 3.750 | 1.000 | 8.000 | .666 | .635 | 2.578 |
| 475 | .281 | 2.000 | 1.500 | .270 | .270 .260 | .781 | .390 | 4.984 | 3.750 | 1.000 | 10.000 | .697 | .635 | 3.094 |
| 650 | .359 | 2.000 | 1.500 | .270 | .270 .260 | .781 | .437 | 5.843 | 3.750 | 1.125 | 11.000 | .843 | .635 | 4.062 |

Bore Data (Key furnished)

| Size | Bore Dia. | Keyway |
|-------------|--|---|
| FB-375 | .626/.625 .501/.500 | 3/16 x 3/32 1/8 x 1/16 |
| FB-475 | .500 – .562 | 1/8 x 1/16 |
| Dodge #1008 | .625 – .875 .937 – 1.000 | 3/16 x 3/32 1/4 x 1/8 |
| FB-650 | .500 – .562 | 1/8 x 1/16 |
| Dodge #1310 | .625 – .875 .937 – 1.250 1.312 – 1.375 | 3/16 x 3/32 1/4 x 1/8 5/16 x 5/32 |

Note: FB-375 has a straight bore. Bushing not required.
Bushings also available in metric bores. See page 139.

ER Series Electrically Released Brakes

Ideal for Dynamic Braking Applications

ER Series Dynamic Engagement Brakes

This brake must be engaged while the shaft is in motion. Shaft speed should be 100 RPM or greater when the brake is engaged. This style brake offers a bulkhead flange mounting system, the highest torque rating offered by Warner Electric in the power released series, high cycle rate capability, and excellent life.

- Expands the electrically released product family with two larger sizes
- Designed for dynamic stopping operations
- High cycle rate capability
- Inside or outside mount options for 475 or 650 sizes
- Normal or heavy duty options available in larger sizes

Selection Procedure

ER Series brakes are available in five sizes. Static torque ratings range from 10.5 lb.ft. to 400 lb.ft.

1. Verify that the brake will be cycled frequently in normal operation.
2. Determine the horsepower and speed at the brake location.
3. The correct size ER Series brake is shown at the intersection of the HP and shaft speed.
4. When ordering, specify voltage and bore size. Available bore sizes are listed in the specifications chart.

How to Order

1. Specify model number
2. For thru-shaft mounting, specify bore size. For ER-475 and ER-650 order bushing separately, ER-375 does not require a bushing.
3. Models ER-475 and ER-650: Specify inside or outside mount. Models ER-825 and ER-1225: Specify normal or heavy duty.
4. See the Controls Section for controls. ER Series brakes require a control with a potentiometer to vary brake channel output. Recommended are:
For ER-825 use CBC-200, -500, or -550.
For ER-1225, use MCS-805-1 or -2.

Flange Mounted Brakes



Powerful permanent magnets.

Never needs adjustment—automatically compensates for wear.

Brake automatically engages when power is turned off.

Pre-burnished to assure rated torque upon installation.

Segmented armature design provides high heat dissipation and long service life.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT BRAKE (IN RPM) | | | | | | | | | | | | | | | | | | | | |
|-------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | 4000 | 4500 | |
| 1/12 | | | | | | | | | | | | | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | | | | | | | |
| 1/6 | | | | | | | | | | | | | | | | | | | | | |
| 1/4 | | | | | | | | | | | | | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | | | | | | | | |

ER Series Electrically Released Brakes

Specifications

| Model | Bore Size | Voltage DC | Static Torque lb. ft. | Max. RPM | Drive | Inertia lb.ft. ² | | Weight lbs. | | Total Weight lbs. |
|---------------|----------------------------------|------------|-----------------------|----------|---------------|-----------------------------|--------------|------------------|----------------|-------------------|
| | | | | | | Arm. & Carrier | Hub | Arm. & Carrier | Hub | |
| ER-375 | .500" & .625" | 90V | 10.5 | 5000 | - | .010 | .001 | .60 | .49 | 4.5 |
| ER-475 | .500" to 1.000" Dodge #1008 | 90V | 21 | 4500 | - | .072 | .006 | 1.13 | | 6.3 |
| ER-650 | .500" to 1.375" Dodge #1310 | 90V | 56 | 3600 | - | .106 | .020 | 2.3 | 1.6 | 13.2 |
| ER-825 ND | .500" to 1.625" Dodge #1615 | 90V | 125 | 3600 | Pin Spline | .323 .326 | .043 .006 | 4.783 5.263 | 1.857 .834 | 15.6 |
| ER-825 HD | .500" to 1.500" Browning #H-1 | 90V | 125 | 3600 | Pin Spline | .323 .326 | .043 .006 | 4.783 5.263 | 1.857 .834 | 15.6 |
| ER-1225 ND | .937" to 3.00" Dodge #3030 | 35-75V | 400 | 3000 | Pin Spline | 1.667 1.737 | .380 .077 | 10.227 13.317 | 6.716 3.582 | 60.3 |
| ER-1225 HD | .75" to 2.687" Browning #Q-1 | 35-75V | 400 | 3000 | Pin Spline | 1.667 1.737 | .380 .077 | 10.227 13.317 | 6.716 3.582 | 60.3 |

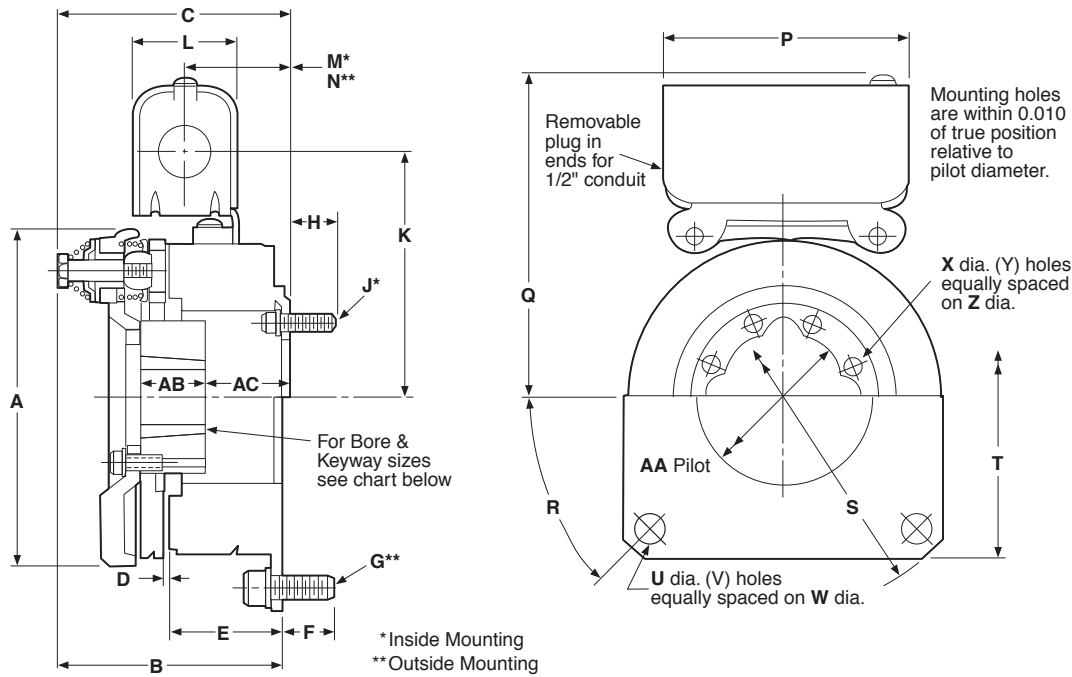
Bushing Part Numbers

| Shaft Size | Keyway Size | Bushing Number | | Shaft Size | Keyway Size | Bushing Number | | Shaft Size | Keyway Size | Bushing Number | |
|------------|-------------|-----------------|----------|------------|-------------|-----------------|----------|------------|--------------|-----------------|----------|
| | | Warner Electric | Browning | | | Warner Electric | Browning | | | Warner Electric | Browning |
| 1/2 | 1/8 x 1/16 | 180-0002 | | 2-5/16 | 5/8 x 5/16 | 180-0051 | | 1-15/16 | 1/2 x 1/4 | 180-0278 | |
| 9/16 | 1/8 x 1/16 | 180-0003 | | 2-3/8 | 5/8 x 5/16 | 180-0052 | | 2 | 1/2 x 1/4 | 180-0279 | |
| 5/8 | 3/16 x 3/32 | 180-0004 | | 2-7/16 | 5/8 x 5/16 | 180-0053 | | 2-1/16 | 1/2 x 1/4 | 180-0280 | |
| 11/16 | 3/16 x 3/32 | 180-0005 | | 2-1/2 | 5/8 x 5/16 | 180-0054 | QI-2 | 2-1/8 | 1/2 x 1/4 | 180-0281 | |
| 3/4 | 3/16 x 3/32 | 180-0006 | | 2-9/16 | 5/8 x 5/16 | 180-0055 | | 2-3/16 | 1/2 x 1/4 | 180-0282 | |
| 13/16 | 3/16 x 3/32 | 180-0007 | | 2-5/8 | 5/8 x 5/16 | 180-0056 | | 2-1/4 | 1/2 x 1/4 | 180-0283 | |
| 7/8 | 3/16 x 3/32 | 180-0008 | | 2-11/16 | 5/8 x 5/16 | 180-0057 | | 2-5/16 | 5/8 x 5/16 | 180-0284 | |
| 15/16 | 1/4 x 1/8 | 180-0009 | H-1 | 1/2 | 1/8 x 1/16 | 180-0131 | | 2-3/8 | 5/8 x 5/16 | 180-0285 | |
| 1 | 1/4 x 1/8 | 180-0010 | | 9/16 | 1/8 x 1/16 | 180-0132 | | 2-7/16 | 5/8 x 5/16 | 180-0286 | 3030 |
| 1-1/16 | 1/4 x 1/8 | 180-0011 | | 5/8 | 3/16 x 3/32 | 180-0133 | | 2-1/2 | 5/8 x 5/16 | 180-0287 | |
| 1-1/8 | 1/4 x 1/8 | 180-0012 | | 11/16 | 3/16 x 3/32 | 180-0134 | | 2-9/16 | 5/8 x 5/16 | 180-0288 | |
| 1-3/16 | 1/4 x 1/8 | 180-0013 | | 3/4 | 3/16 x 3/32 | 180-0135 | | 2-5/8 | 5/8 x 5/16 | 180-0289 | |
| 1-1/4 | 1/4 x 1/8 | 180-0014 | | 13/16 | 3/16 x 3/32 | 180-0136 | | 2-11/16 | 5/8 x 5/16 | 180-0290 | |
| 1-5/16 | 5/16 x 5/32 | 180-0015 | | 7/8 | 3/16 x 3/32 | 180-0137 | | 2-3/4 | 5/8 x 5/16 | 180-0291 | |
| 1-3/8 | 5/16 x 5/32 | 180-0016 | | 15/16 | 1/4 x 1/8 | 180-0138 | | 2-13/16 | 3/4 x 3/8 | 180-0292 | |
| 1-7/16 | 3/8 x 3/16 | 180-0017 | H-2 | 1 | 1/4 x 1/8 | 180-0139 | | 2-7/8 | 3/4 x 3/8 | 180-0293 | |
| 1-1/2 | 3/8 x 3/16 | 180-0018 | | 1-1/16 | 1/4 x 1/8 | 180-0140 | 1615 | 2-15/16 | 3/4 x 3/8 | 180-0294 | |
| 3/4 | 3/16 x 3/32 | 180-0026 | | 1-1/8 | 1/4 x 1/8 | 180-0141 | | 3 | 3/4 x 3/8 | 180-0295 | |
| 13/16 | 3/16 x 3/32 | 180-0027 | | 1-3/16 | 1/4 x 1/8 | 180-0142 | | 1/2 | 1/8 x 1/16 | 180-0410 | |
| 7/8 | 3/16 x 3/32 | 180-0028 | | 1-1/4 | 1/4 x 1/8 | 180-0143 | | 9/16 | 1/8 x 1/16 | 180-0411 | |
| 15/16 | 1/4 x 1/8 | 180-0029 | | 1-5/16 | 5/16 x 5/32 | 180-0144 | | 5/8 | 3/16 x 3/32 | 180-0412 | |
| 1 | 1/4 x 1/8 | 180-0030 | | 1-3/8 | 5/16 x 5/32 | 180-0145 | | 11/16 | 3/16 x 3/32 | 180-0413 | |
| 1-1/16 | 1/4 x 1/8 | 180-0031 | | 1-7/16 | 3/8 x 3/16 | 180-0146 | | 3/4 | 3/16 x 3/32 | 180-0414 | 1008 |
| 1-1/8 | 1/4 x 1/8 | 180-0032 | | 1-1/2 | 3/8 x 3/16 | 180-0147 | | 13/16 | 3/16 x 3/32 | 180-0415 | |
| 1-3/16 | 1/4 x 1/8 | 180-0033 | | 1-9/16 | 3/8 x 3/16 | 180-0148 | | 7/8 | 3/16 x 3/32 | 180-0416 | |
| 1-1/4 | 1/4 x 1/8 | 180-0034 | | 1-5/8 | 3/8 x 3/16 | 180-0149 | | 15/16 | 1/4 x 1/16 | 180-0417 | |
| 1-5/16 | 5/16 x 5/32 | 180-0035 | QI-1 | 15/16 | 1/4 x 1/8 | 180-0262 | | 1 | 1/4 x 1/16 | 180-0418 | |
| 1-3/8 | 5/16 x 5/32 | 180-0036 | | 1 | 1/4 x 1/8 | 180-0263 | | 1/2 | 1/8 x 1/16 | 180-0421 | |
| 1-7/16 | 3/8 x 3/16 | 180-0037 | | 1-1/16 | 1/4 x 1/8 | 180-0264 | | 9/16 | 1/8 x 1/16 | 180-0422 | |
| 1-1/2 | 3/8 x 3/16 | 180-0038 | | 1-1/8 | 1/4 x 1/8 | 180-0265 | | 5/8 | 3/16 x 3/32 | 180-0423 | |
| 1-9/16 | 3/8 x 3/16 | 180-0039 | | 1-3/16 | 1/4 x 1/8 | 180-0266 | | 11/16 | 3/16 x 3/32 | 180-0424 | |
| 1-5/8 | 3/8 x 3/16 | 180-0040 | | 1-1/4 | 1/4 x 1/8 | 180-0267 | | 3/4 | 3/16 x 3/32 | 180-0425 | |
| 1-11/16 | 3/8 x 3/16 | 180-0041 | | 1-5/16 | 5/16 x 5/32 | 180-0268 | | 13/16 | 3/16 x 3/32 | 180-0426 | |
| 1-3/4 | 3/8 x 3/16 | 180-0042 | | 1-3/8 | 5/16 x 5/32 | 180-0269 | 3030 | 7/8 | 3/16 x 3/32 | 180-0427 | |
| 1-13/16 | 1/2 x 1/4 | 180-0043 | | 1-7/16 | 3/8 x 3/16 | 180-0270 | | 15/16 | 1/4 x 1/16 | 180-0428 | 1310 |
| 1-7/8 | 1/2 x 1/4 | 180-0044 | | 1-1/2 | 3/8 x 3/16 | 180-0271 | | 1 | 1/4 x 1/8 | 180-0429 | |
| 1-15/16 | 1/2 x 1/4 | 180-0045 | | 1-9/16 | 3/8 x 3/16 | 180-0272 | | 1-1/16 | 1/4 x 1/8 | 180-0430 | |
| 2 | 1/2 x 1/4 | 180-0046 | | 1-5/8 | 3/8 x 3/16 | 180-0273 | | 1-1/8 | 1/4 x 1/8 | 180-0431 | |
| 2-1/16 | 1/2 x 1/4 | 180-0047 | | 1-11/16 | 3/8 x 3/16 | 180-0274 | | 1-3/16 | 1/4 x 1/8 | 180-0432 | |
| 2-1/8 | 1/2 x 1/4 | 180-0048 | QI-2 | 1-3/4 | 3/8 x 3/16 | 180-0275 | | 1-1/4 | 1/4 x 1/8 | 180-0433 | |
| 2-3/16 | 1/2 x 1/4 | 180-0049 | | 1-13/16 | 1/2 x 1/4 | 180-0276 | | 1-5/16 | 15/16 x 5/32 | 180-0434 | |
| 2-1/4 | 1/2 x 1/4 | 180-0050 | | 1-7/8 | 1/2 x 1/4 | 180-0277 | | 1-3/8 | 15/16 x 5/32 | 180-0435 | |

Browning® is registered to Emerson Electric Co.
Dodge and Browning bushings are also available in metric bores.

ER Series Electrically Released Brakes

ER-375, ER-475, ER-650



Dimensions

All dimensions are nominal, unless otherwise noted.

| Size | A Max. | B Max. | C Max. | D | E | F Max. | G | H Max. | J | K | L | M | N | P |
|------|--------|--------|--------|------|-------|--------|-------------------|--------|-------------------|-------|-------|-------|-------|-------|
| 375 | 4.078 | 2.583 | 2.583 | .032 | 1.410 | .600 | 5/16-18 UNC-3A | — | — | 3.325 | 1.547 | — | — | 3.750 |
| 475 | 5.172 | 3.195 | 3.274 | .031 | 1.630 | .431 | 3/8-16 UNC-3A | .390 | 8-32 | 3.875 | 1.547 | 1.354 | 1.236 | 3.750 |
| 650 | 6.578 | 3.525 | 3.525 | .032 | 1.880 | .542 | 5/16-18 UNC-3A | .542 | 5/16-18 UNC-3A | 4.800 | 1.547 | — | — | 3.750 |

| Size | Q Max. | R | S | T Sq. | U | V | W Dia. | X | Y | Z Dia. | AA Dia. | AB | AC |
|------|--------|-----|----------------|-------|--------------|---|--------|--------------|---|--------|----------------|--------|----------------------------|
| 375 | 4.505 | — | 5.625 5.623 | — | .350 .341 | 3 | 5.000 | — | — | — | — | 23/32 | 1-3/4 |
| 475 | 5.000 | 45° | 6.500 6.498 | 5.000 | .419 .403 | 4 | 5.875 | .208 .201 | 8 | 2.375 | 2.065 2.062 | 29/32 | 1-3/16 I.M. 1-1/16 O.M. |
| 650 | 5.844 | 45° | 8.000 7.998 | 6.500 | .358 .338 | 4 | 7.250 | .358 .338 | 4 | 3.688 | 2.822 2.820 | 1-1/32 | 1-3/8 |

Mounting Requirements

Customer Shall Maintain:

- Squareness of brake mounting face with armature hub shaft within .006 T.I.R.
- Concentricity of brake mounting pilot diameter with armature hub shaft within .010 T.I.R.
- If magnet mounting surface is a magnetic material, the magnet is to be insulated approximately 1/2" from that surface with a plate or spacers of non-magnetic material.

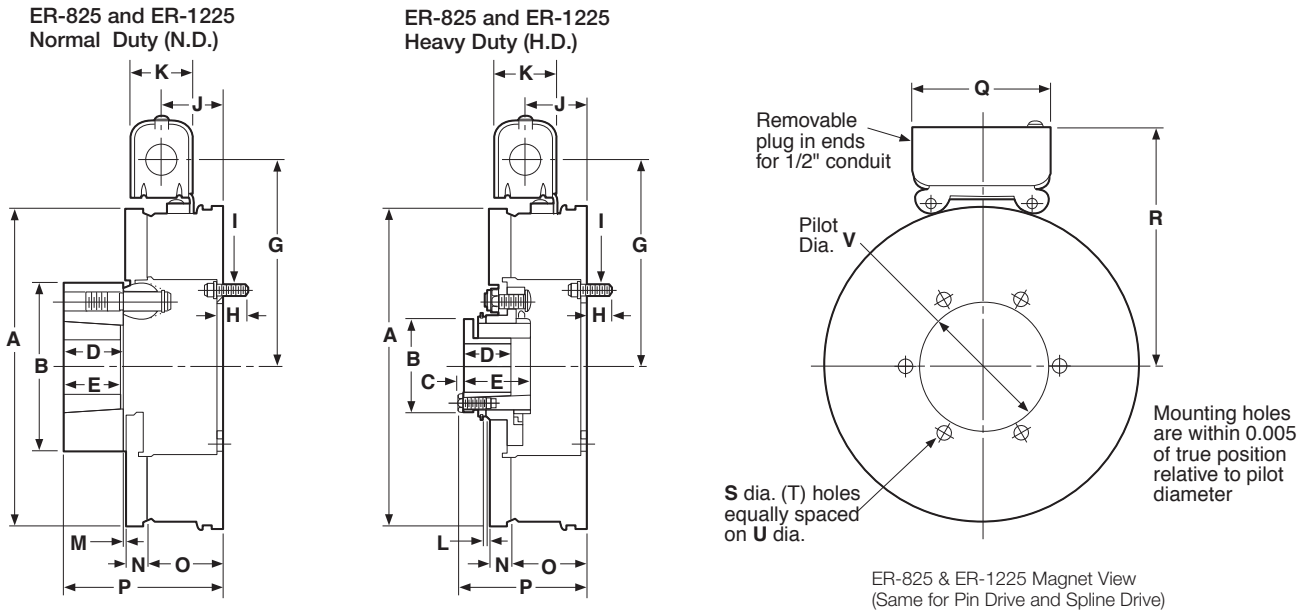
ER-375 available outside mounted only.

Bore and Keyway Dimensions

| Size | Bore Dia. | Keyway |
|------|--------------------------------|--------------------------|
| 375 | .501/.500 | 1/8 x 1/16 |
| | .626/.625 | 3/16 x 3/32 |
| 475 | .500 - .562 | 1/8 x 1/16 |
| | .625 - .875 | 3/16 x 3/32 |
| | .937 - 1.000 | 1/4 x 1/8 |
| 650 | .500 - .562 | 1/8 x 1/16 |
| | .625 - .875 | 3/16 x 3/32 |
| | 1.000 - 1.250 1.312 - 1.375 | 1/4 x 1/8 5/16 x 5/32 |

ER Series Electrically Released Brakes

ER-825, ER-1225



| Size | A Max. | B Dia. | C | D | E | G | H Max. | I | J | K Min. | L Min. |
|-----------|--------|--------|------|-------|-------|-------|--------|-------------------|-------|--------|--------|
| 825 N.D. | 8.656 | 4.625 | — | 1.593 | 1.500 | 5.625 | .531 | 5/16-18 UNC-3A | 1.687 | 1.546 | — |
| 825 H.D. | 8.656 | 2.500 | .156 | 1.250 | 1.765 | 5.625 | .531 | 5/16-18 UNC-3A | 1.687 | 1.546 | .062 |
| 1225 N.D. | 12.671 | 6.875 | — | 3.000 | 3.000 | 7.671 | .546 | 5/16-18 UNC-3A | 1.718 | 1.546 | — |
| 1225 H.D. | 12.671 | 4.093 | .234 | 2.500 | 2.171 | 7.671 | .546 | 5/16-18 UNC-3A | 1.718 | 1.546 | .062 |

| Size | M When New | N | O | P Max. | Q | R Max. | S | T | U | V |
|-----------|------------|------|---------------|--------|-------|----------------|------|---|-------|-------|
| 825 N.D. | .093 | .562 | 2.080 .338 | 4.359 | 3.750 | 6.750 3.501 | .358 | 6 | 4.250 | 3.503 |
| 825 H.D. | — | .531 | 2.080 .338 | 3.546 | 3.750 | 6.750 3.501 | .358 | 6 | 4.250 | 3.503 |
| 1225 N.D. | .156 | .593 | 2.500 .338 | 6.218 | 3.750 | 8.796 6.376 | .358 | 6 | 7.250 | 6.378 |
| 1225 H.D. | — | .562 | 2.500 .338 | 5.031 | 3.750 | 8.796 6.376 | .358 | 6 | 7.250 | 6.378 |

Bore and Keyway Dimensions

| ER-825 | Bore Dia. | Keyway |
|--------------|----------------|-------------|
| Pin Drive | .500 - .562 | 1/8 x 1/16 |
| | .625 - .875 | 3/16 x 3/32 |
| | .937 - 1.250 | 1/4 x 1/8 |
| | 1.312 - 1.375 | 5/16 x 5/32 |
| | 1.437 - 1.500 | 3/8 x 3/16 |
| | 1.562 - 1.625* | 3/8 x 3/16 |
| Spline Drive | .500 - .562 | 1/8 x 1/16 |
| | .375 - .625 | 3/16 x 3/32 |
| | .937 - 1.187 | 1/4 x 1/8 |
| | 1.250* | 1/4 x 1/8 |
| | 1.312 - 1.375* | 5/16 x 5/32 |
| | 1.437 - 1.500* | 3/8 x 3/16 |
| ER-1225 | | |
| Pin Drive | .937 - 1.250 | 1/4 x 1/8 |
| | 1.312 - 1.375 | 5/16 x 5/32 |
| | 1.437 - 1.750 | 3/8 x 3/16 |
| | 1.812 - 2.250 | 1/2 x 1/4 |
| | 2.312 - 2.750 | 5/8 x 5/16 |
| | 2.187 - 3.000* | 3/4 x 3/8 |
| Spline Drive | .750 - .875 | 3/16 x 3/32 |
| | .937 - 1.250 | 1/4 x 1/8 |
| | 1.312 - 1.375 | 5/16 x 5/32 |
| | 1.437 - 1.750 | 3/8 x 3/16 |
| | 1.812 - 2.062 | 1/2 x 1/4 |
| | 2.125 - 2.250* | 1/2 x 1/4 |
| | 2.312 - 2.687 | 5/8 x 5/16 |

*Key furnished

Mounting Requirements

Customer Shall Maintain

- Squareness of magnet mounting face with armature shaft within .006 T.I.R.
- Concentricity of magnet mounting pilot diameter with armature shaft within .010 T.I.R.
- If magnet mounting surface is a magnetic material, the magnet is to be insulated approximately 1/2" from that surface with a plate or spacers of non-magnetic material.

Electrically Released Brakes

For Dynamic Stopping and Cycling Applications

Warner Electric's modular design brakes and clutch/brake units offer material handling system users a high performance alternative to spring-set brakes. These modular units provide long life, maintenance free operation, and consistent performance with minimal downtime.

These brakes are offered in power-off types for double shaft motors and for installation between C-face motor and reducer or other drive device. Powerful permanent magnets generate braking torque. The brakes release when voltage is applied to the coil, countering the force of the permanent magnets. No power is required to stop or hold a load. An optional integral conduit box provides simple wiring direct from the motor power leads.

- Designed for dynamic stopping operations
- Brake automatically engages when power is turned off
- High cycle rate capability
- Never needs adjustment – automatically compensates for wear
- Powerful permanent magnets provide braking force
- Choice of open or enclosed brakes
- Prepackaged, preburnished UM version



Electrically Released Brakes

UM Series (UniModule Clutch/Brakes)

Pre-assembled clutch/electrically released brake modules



- The UM-1020-FBC brake/motor clutch combination is used for clutch/power-off brake applications. It mounts directly to C-face compatible components.
- The UM-2030-FBC brake/input clutch combination is used for clutch/power-off brake applications. It has shafts on both the input and output sides for base mounting.

EUM Series (Enclosed Motor Brakes)

Totally enclosed non-vented units that keep wear particles in and contaminants out



- The EUM-FBB brake unit can be mounted between two C-face compatible components.
- The EUM-MBFB motor brake is mounted directly to the rear of a double-shafted motor.

EM Series (Electro Module Brakes and Clutch/Brakes)

Comprised of individual units that may bolt together to form various combinations



- The EM-FBB brake module mounts between a C-face motor and a gear box or reducer.
- The EM-MBFB motor brake module is mounted to the rear of a double-shafted motor.
- The EM-FBC brake module is used in combination with a motor clutch or input clutch unit to make a clutch/electrically released brake or can be used alone as a brake only.

EEM Series (Enclosed Electro Module Brakes and Clutch/Brakes)

Enclosed electro modules package the hardworking components from EM products into totally enclosed housings

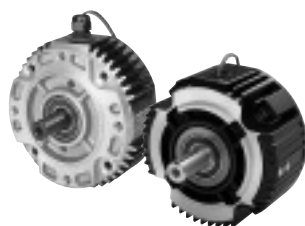


Brake Modules (FBB)

For mounting between a C-face motor and a gearbox or reducer

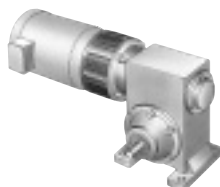
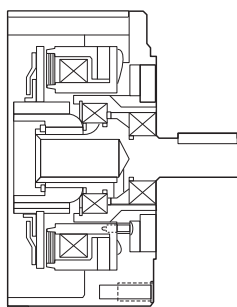


EM Series (shaft mounted, vented housing)



EUM Series (shaft mounted, totally enclosed non-vented housing)

Use for brake alone applications.



Features

- Single armature for brake alone applications
- Output shaft
- Permanent magnets
- UL listed

EM-FBB

Available in 5 sizes

EUM-FBB

Available in 5 sizes

EM-FBB Electro Module brake unit between a motor and a reducer.

UM-FBC Series Electrically Released Brakes

UniModule Clutch/Electrically Released Brake Combination

Warner Electric offers the convenience of pre-assembled UniModule clutch/electrically released brake packages. Assembly, alignment, and pre-burnishing have been done at the factory. Bolt it on, wire it up, and your clutch/electrically released brake is ready to go. Available in both C-face and base mounted versions.

Warner Electric's unique design employs powerful permanent magnets for maximum torque when power is removed from the brake coil. A small amount of electrical power applied to the brake coil nullifies the permanent magnets and the brake releases. No springs to limit cycle rates. Never any adjustments. No lubrication. These brakes are recommended for dynamic cycling operations only.



GEN 2 Design
Sizes 50, 100 & 180

Original Design
Sizes 210 & 215



1020-FBC

Motor Clutch/Electrically Released Brake

Use for clutch/power-off brake applications. Has clutch input and brake on output side. Employs powerful permanent magnets for maximum torque when power is removed from the brake coil. Basic components are field, rotor, 2 armatures and power-off magnet. See page 149 for specifications.



2030-FBC

Input Clutch/Electrically Released Brake

Use for clutch/power-off brake applications. Has shafts on input and output sides. When electrical power is applied to the brake coil the brake releases. Ideal for dynamic cycling operations. Basic components are field, rotor, 2 armatures and power-off magnet. See page 150 for specifications.



2030-FBC-B

Input Clutch/Electrically Released Brake with Accessory Base Mounting

See page 150 for specifications.

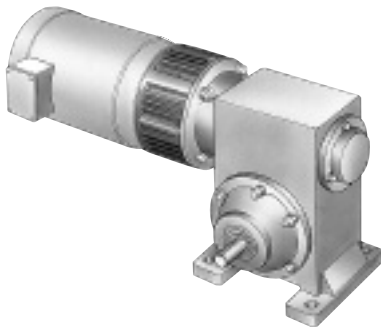
UM-FBC Series Electrically Released Brakes

Selection

UniModule clutch/electrically released brake units may be mounted directly to NEMA C-face motors and reducers, or can be base mounted.

1. Select Configuration

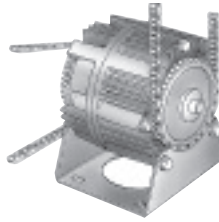
a. NEMA C-face Mounting (1020 Configuration)



Verify the unit will be cycled frequently.

To select the correct UniModule package, determine the NEMA frame size of your motor and/or reducer, and choose the corresponding size UniModule from the Frame Size Selection chart. Verify torque ratings.

b. Base Mounting (2030 Configuration)



Verify the unit will be cycled frequently.

Select the correct size module from the Horsepower vs. Shaft Speed chart by determining the motor horsepower and RPM at the module location. The correct size UniModule is shown at the intersection of the HP and operating speed. For additional sizing information, refer to the technical sizing procedure (step 2).

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-------|------------------|------|------|------|------|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 |
| 1/4 | | | | | | | | | | | | | UM-50 | | | | | |
| 1/2 | | | | | | | | | | | | | UM-50 | | | | | |
| 3/4 | | | | | | | | | | | | | | UM-100 or UM-180 | | | | |
| 1 | | | | | | | | | | | | | | UM-100 or UM-180 | | | | |
| 1-1/2 | | | | | | | | | | | | | | UM-100 or UM-180 | | | | |
| 2 | | | | | | | | | | | | | | UM-210 or UM-215 | | | | |
| 3 | | | | | | | | | | | | | | UM-210 or UM-215 | | | | |
| 5 | | | | | | | | | | | | | | UM-210 or UM-215 | | | | |
| 7-1/2 | | | | | | | | | | | | | | UM-210 or UM-215 | | | | |

Frame Size Selection and Technical Ratings Chart (Blue shaded areas indicate GEN 2 design)

| NEMA Frame Size | UniModule Size | Static Torque Brake lb.ft. | Static Torque Clutch lb.ft. | Max. RPM | Voltage DC |
|--------------------------|----------------|----------------------------|-----------------------------|----------|------------|
| 56C/48Y | UM-50* | 10.5 | 16 | 3600 | 24 or 90 |
| | UM-100** | 21 | 30 | | |
| 182C/143TC 184C/145TC | UM-180 | 21 | 30 | 3600 | 24 or 90 |
| 213C/182TC 215C/184TC | UM-210 | 56 | 95 | 3600 | 24 or 90 |
| 213TC/215TC | UM-215 | 56 | 95 | 3600 | 24 or 90 |

*For 56C/48Y C-frame motors 3/4 HP and smaller, the UM-100 size may be used where extended life is desirable.

**The UM-100 size is recommended for motors 1 HP and larger.

UM-FBC Series Electrically Released Brakes

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100)^2 \times F$$

where:

E = Heat (lb. ft./min.)

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

N = Speed in revolutions per minute (RPM)

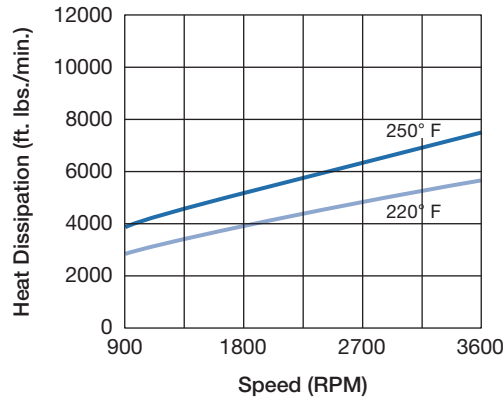
F = Cycle rate in cycles per minute (CPM)

Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Heat Dissipation Curves

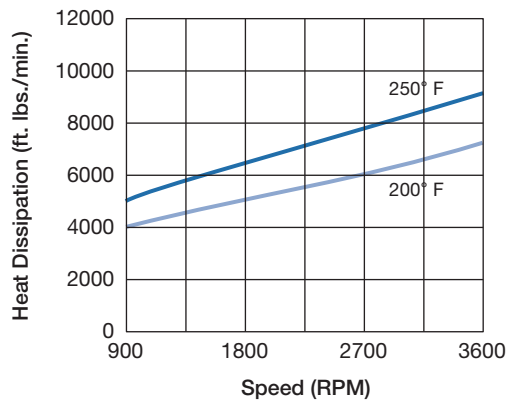
Size 50

Maximum Speed 3600 RPM



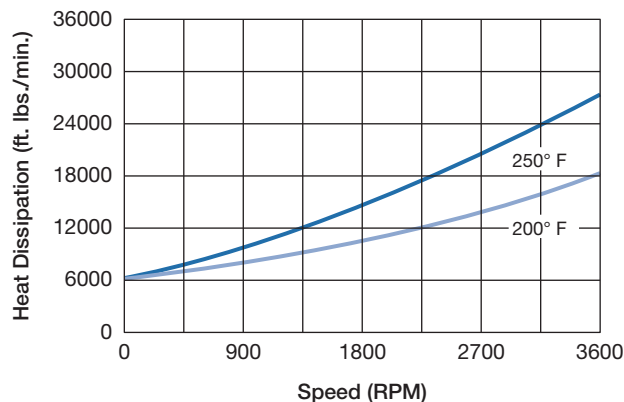
Size 100/180

Maximum Speed 3600 RPM



Size 210/215

Maximum Speed 3600 RPM



UM-FBC Series Electrically Released Brakes

b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart on page 145. Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the technical ratings chart to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

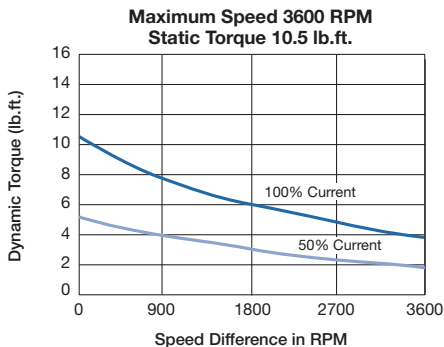
WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute (RPM)

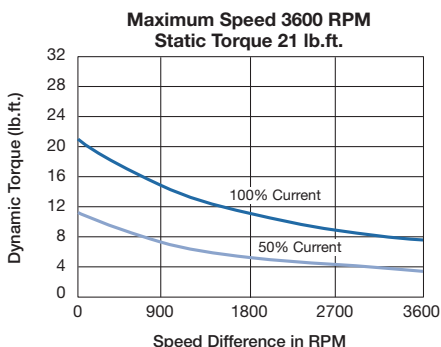
t = Time allowed for the engagement (sec)

C-face Electrically Released Brake Dynamic Torque Curves

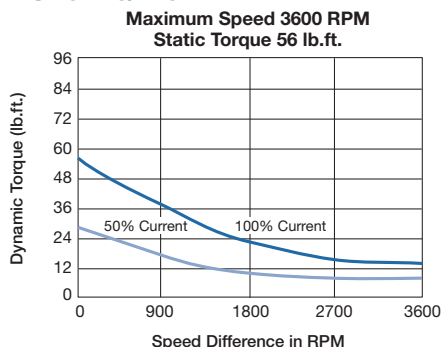
Size 50



Size 100/180

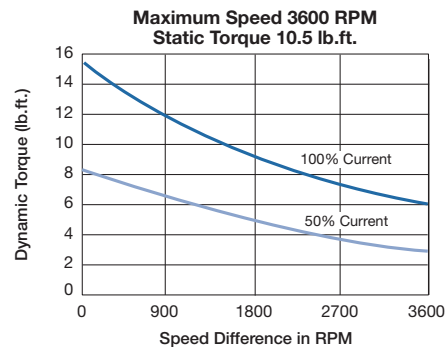


Size 210/215

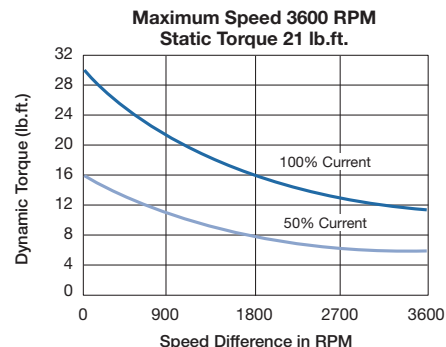


C-face Clutch Dynamic Torque Curves

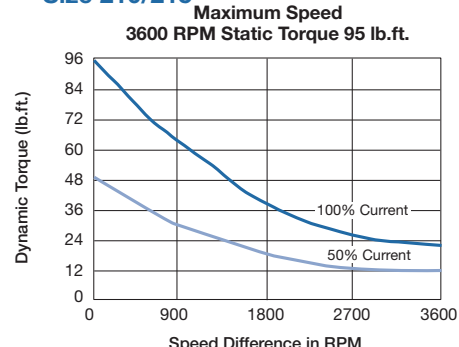
Size 50



Size 100/180



Size 210/215



UM-FBC Series Electrically Released Brakes

Ordering Information

Specifications (Max. Speed 3600 RPM) (Blue shaded areas indicate GEN 2 design)

| Size | Voltage DC | Weight (lbs.) | | Armature | | Component Inertia-WR ² (lb. ft. ²) | | | | | NEMA Frame Size |
|------|------------|---------------|------|----------|------|---|---------------------|--------------|-------------|---------------------|--------------------------|
| | | 1020 | | 2030 | | 1020 | | 2030 | | | |
| | | 1020 | 2030 | (both) | Hub | Shaft | Rotor w/Fan and Hub | Output Shaft | Input Shaft | Rotor w/Fan and Hub | |
| 50 | 24 90 | 15.6 | 18.4 | .018 | .001 | .001 | .020 | .001 | .001 | .020 | 56C/48Y |
| 100 | 24 90 | 18.7 | 21.7 | .046 | .002 | .002 | .046 | .002 | .002 | .046 | 56C/48Y |
| 180 | 24 90 | 18.7 | 21.7 | .046 | .002 | .002 | .046 | .002 | .002 | .046 | 182C/143TC 184C/145TC |
| 210 | 24 90 | 36 | 47 | .162 | .016 | .014 | .190 | .016 | .015 | .183 | 213C/182TC 215C/184TC |
| 215 | 24 90 | 37 | 48 | .162 | .016 | .016 | .190 | .017 | .016 | .183 | 213TC/215TC |

3. Select Options

Warner Electric Enclosed UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

4. Select Control

All electrically released modules require a control with a potentiometer that will vary brake channel output. UM-FBC units require either a CBC-300 or a CBC 500/550 control.

Part Numbers (Blue shaded areas indicate GEN 2 design)

| Model No. | Voltage DC | GEN 2 Part No. | Original Part No. |
|-------------------------------|------------|----------------|-------------------|
| Motor Clutch/ ER Brake | | | |
| UM-50-1020FBC | 24 | 5370-273-243 | 5370-273-037 |
| UM-50-1020FBC | 90 | 5370-273-244 | 5370-273-036 |
| UM-100-1020FBC | 24 | 5370-273-248 | 5370-273-153 |
| UM-100-1020FBC | 90 | 5370-273-249 | 5370-273-125 |
| UM-180-1020FBC | 24 | 5370-273-253 | 5370-273-047 |
| UM-180-1020FBC | 90 | 5370-273-254 | 5370-273-046 |
| UM-210-1020FBC | 24 | | 5371-273-013 |
| UM-210-1020FBC | 90 | | 5371-273-012 |
| UM-215-1020FBC | 24 | | 5371-273-099 |
| UM-215-1020FBC | 90 | | 5371-273-079 |
| Input Clutch/ ER Brake | | | |
| UM-50-2030FBC | 24 | 5370-273-258 | 5370-273-042 |
| UM-50-2030FBC | 90 | 5370-273-259 | 5370-273-041 |
| UM-100-2030FBC | 24 | 5370-273-263 | 5370-273-154 |
| UM-100-2030FBC | 90 | 5370-273-264 | 5370-273-155 |
| UM-180-2030FBC | 24 | 5370-273-268 | 5370-273-052 |
| UM-180-2030FBC | 90 | 5370-273-269 | 5370-273-051 |
| UM-210-2030FBC | 24 | | 5371-273-018 |
| UM-210-2030FBC | 90 | | 5371-273-017 |
| UM-215-2030FBC | 24 | | 5371-273-100 |
| UM-215-2030FBC | 90 | | 5371-273-101 |

Accessories

| Description | UM Size | Part No. |
|---------------------------------|------------------------|--------------|
| Conduit Box | UM series All sizes | 5370-101-042 |
| Base Mount Kit for 2030 FBC | 50/100 | 5370-101-004 |
| | 180 | 5370-101-002 |
| | 210/215 | 5371-101-019 |
| Motor Mount Kit for 1020 FBC | 50/100 | 5370-101-078 |
| | 180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| Cover Kit | 50/100/180 | 5370-101-076 |

How to Order

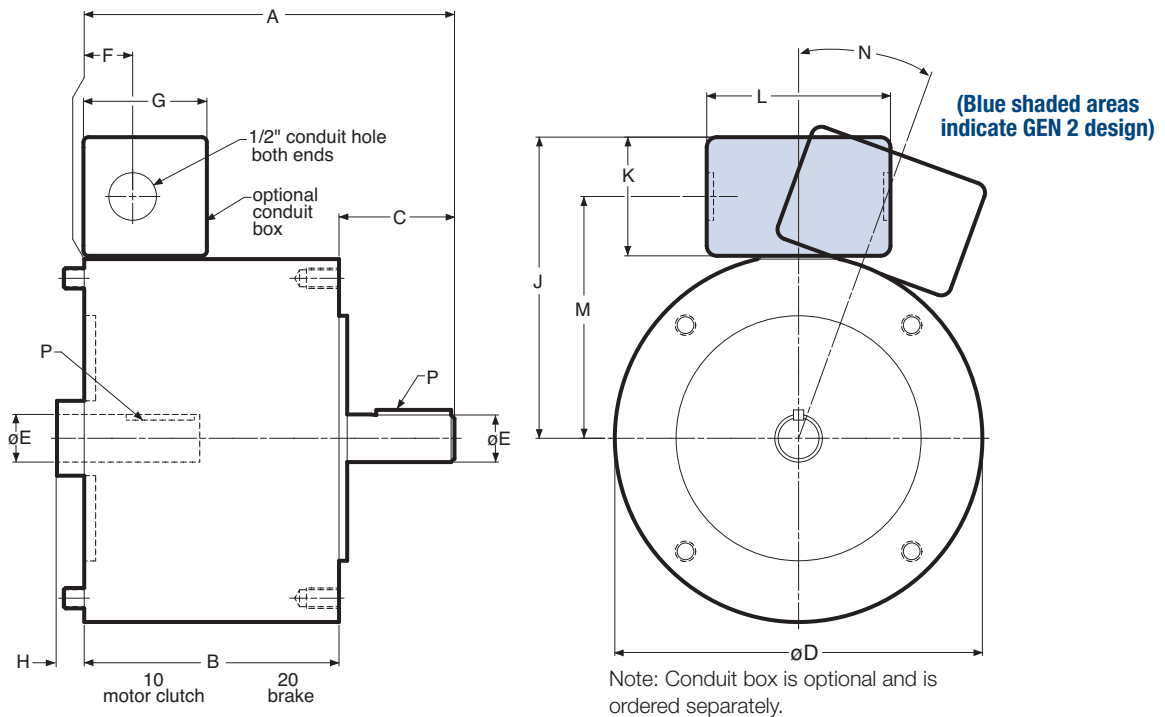
1. Specify model number and voltage or the corresponding part number.
2. Specify conduit box, if desired.
3. Specify required control unit. See the Controls Section (page 201).

Ordering Example

UM-50-1020FBC, 90V or 5370-273-244; 5370-101-042 conduit box; CBC-300 control.

UM-FBC Series Electrically Released Brakes

UM-1020 FBC Motor Clutch/Electrically Released Brake



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|------|--------|-------|-------|-------|-------|------|-------|------|
| 50 | 6.720 | 4.680 | 2.040 | 6.750 | .625 | .890 | 2.267 | — |
| 100 | 6.741 | 4.680 | 2.061 | 6.750 | .625 | .890 | 2.267 | — |
| 180 | 6.801 | 4.680 | 2.121 | 6.750 | .875 | .890 | 2.267 | — |
| 210 | 9.688 | 7.031 | 2.500 | 9.250 | 1.125 | .500 | 2.267 | .500 |
| 215 | 10.568 | 7.440 | 3.125 | 9.250 | 1.375 | .500 | 2.267 | .500 |

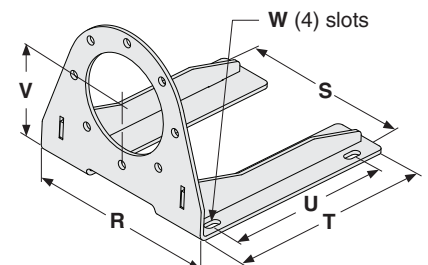
| Size | J | K | L | M | N | P |
|------|-------|-------|-------|-------|-----|-------------|
| 50 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 100 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 180 | 5.516 | 2.180 | 3.250 | 4.426 | 0° | 3/16 x 3/16 |
| 210 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 1/4 x 1/4 |
| 215 | 6.859 | 2.180 | 3.250 | 5.766 | 20° | 5/16 x 5/16 |

For standard NEMA frame dimensions, see page 187.

Motor Mount (M) Dimensions (Blue shaded areas indicate GEN 2 design)

For use with 1020, 1040, 20, 20 FBB and 1020 FBC Combinations.

| Size | R | S | T | U | V | W | Part No. |
|---------|--------|--------|--------|-------|-------|-------------|--------------|
| 50/100 | 9.250 | 8.250 | 10.500 | 8.000 | 3.500 | .800 x .406 | 5370-101-078 |
| 180 | 9.250 | 8.250 | 10.500 | 8.000 | 4.500 | .800 x .406 | 5370-101-079 |
| 210/215 | 11.500 | 10.500 | 12.000 | 9.000 | 5.250 | .750 x .409 | 5371-101-012 |

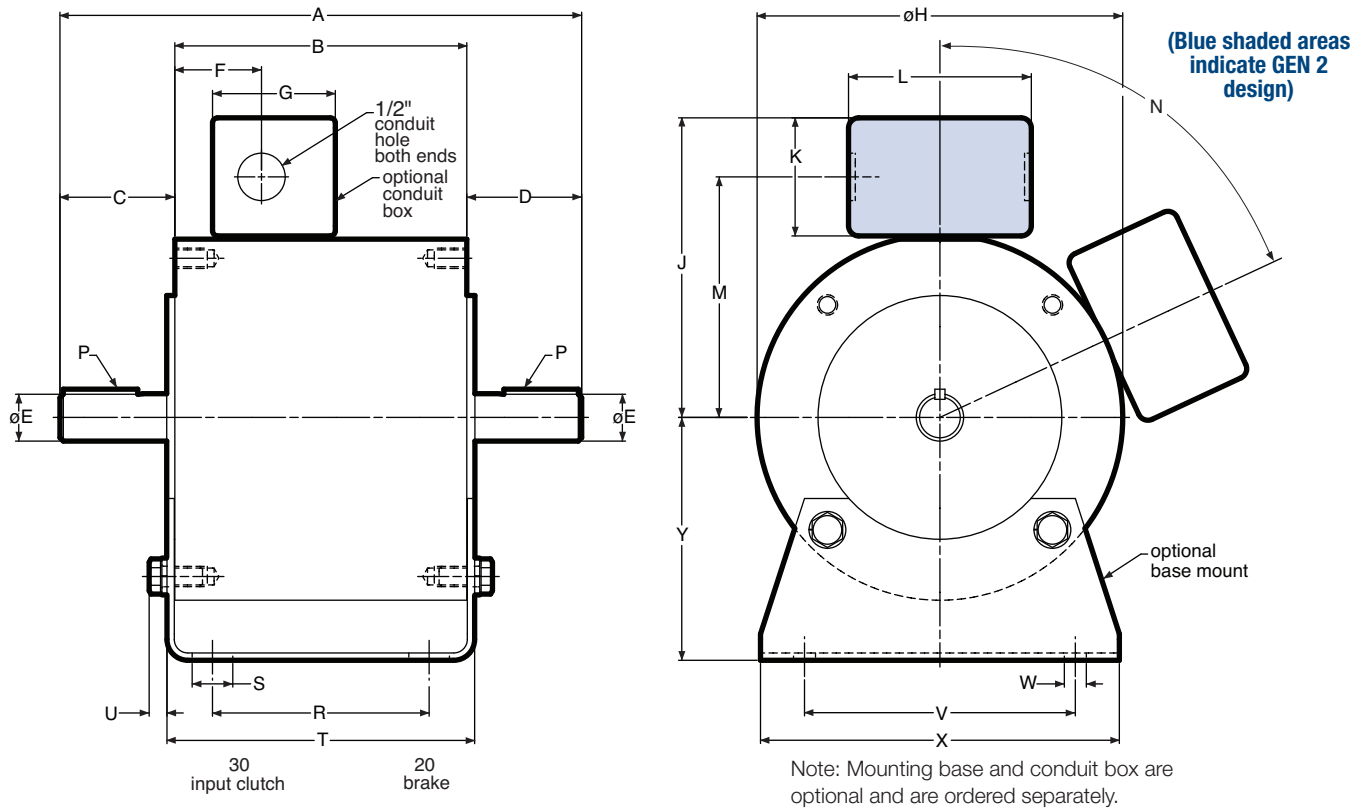


Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

UM-FBC Series Electrically Released Brakes

UM-2030 FBC Input Clutch/Electrically Released Brake

UM-2030 FBC-B Input Clutch/Electrically Released Brake – Base Mounted



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H | J | K | L | M |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 50 | 9.492 | 5.390 | 2.062 | 2.040 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 100 | 9.512 | 5.390 | 2.061 | 2.061 | .625 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 180 | 9.632 | 5.390 | 2.121 | 2.121 | .875 | 1.600 | 2.267 | 6.750 | 5.516 | 2.180 | 3.250 | 4.426 |
| 210 | 13.766 | 8.516 | 2.500 | 2.500 | 1.125 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |
| 215 | 13.766 | 8.516 | 2.500 | 2.500 | 1.375 | 1.812 | 2.267 | 9.250 | 6.859 | 2.180 | 3.250 | 5.766 |

| Size | N | P | R | S | T | U | V | W | X | Y |
|------|-----|-------------|-------|------|-------|------|-------|------|-------|-------|
| 50 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 100 | 0° | 3/16 x 3/16 | 4.000 | .800 | 5.680 | .329 | 5.000 | .406 | 6.000 | 3.500 |
| 180 | 0° | 3/16 x 3/16 | 4.000 | .750 | 5.680 | .329 | 5.000 | .406 | 6.625 | 4.500 |
| 210 | 65° | 1/4 x 1/4 | 6.000 | .750 | 8.989 | .437 | 7.750 | .534 | 9.000 | 5.250 |
| 215 | 65° | 5/16 x 5/16 | 6.000 | .750 | 8.989 | .437 | 7.750 | .534 | 9.000 | 5.250 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

EUM Series Electrically Released Brakes

Enclosed UniModules Contamination-Proof Design

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.

Totally Enclosed Version

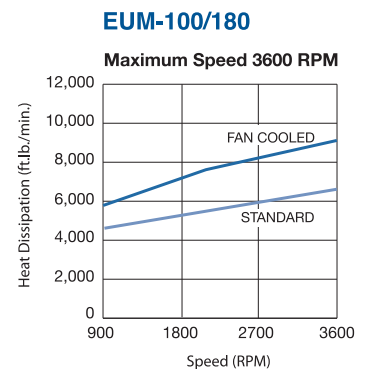
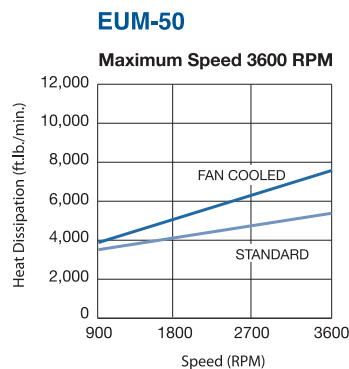
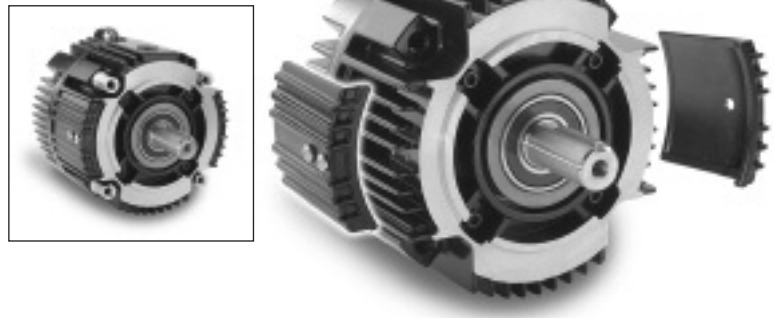
The Enclosed UniModule packages the hardworking components from UM products into a totally enclosed housing. This rugged housing keeps wear particles in and contaminants out and provides quiet operation. Pre-burnished at the factory for rated torque directly out-of-box. When enclosed, they are suitable for most industrial applications and tolerate infrequent, light washing.

- Keeps contaminants out
- Keeps wear particles in
- Quiet operation
- Finned for heat dissipation
- UL listed when optional conduit box is installed

To convert any Gen 2 UniModule 50, 100, and 180 sizes to an enclosed model purchase optional Cover Kit
(part number 5370-101-076)

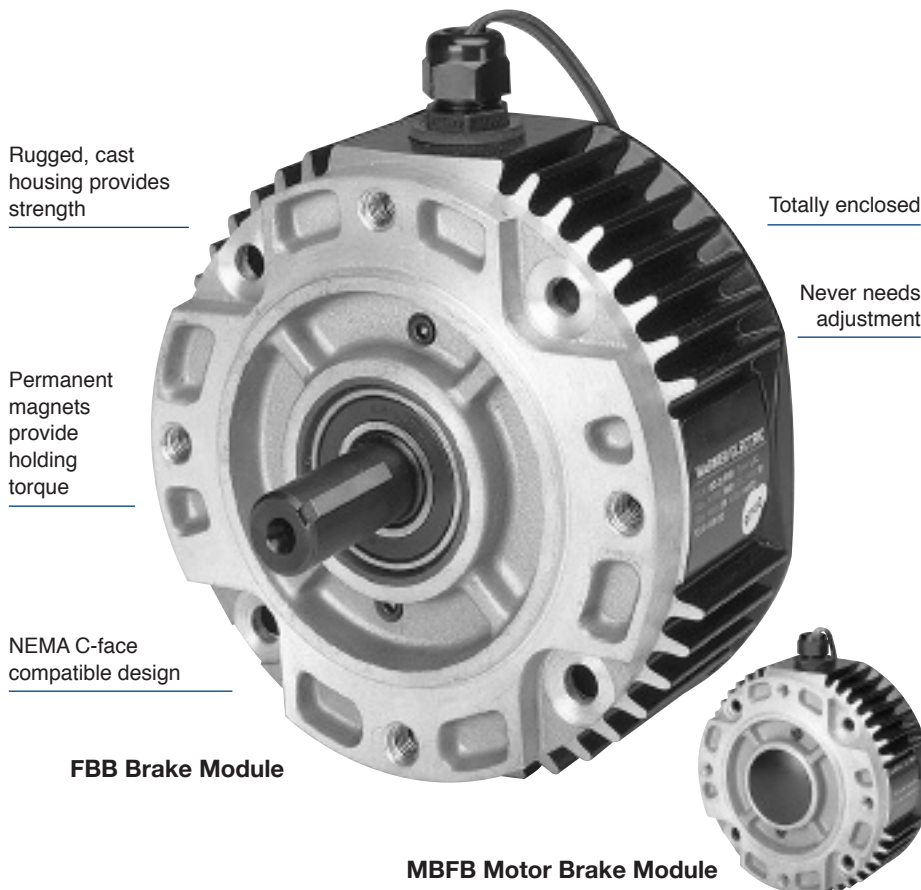
Enclosed UniModule Conversion

Enclosed UniModules, (EUMs) for 50, 100, and 180 sizes, are being replaced by GEN 2 UniModules (UMs) and an easy to install cover kit. Each kit contains (2) vent covers, (2) gaskets and (4) screws. A vent cover bolts to both sides of the UniModule unit to enclose the open vents of the housing creating a totally enclosed (non-washdown) brake package which keeps contaminants out and wear particles in for clean, quiet operation.



EUM Series Electrically Released Brakes

Preassembled, Totally Enclosed, Electrically Released Brake Units



Available in Two Design Styles

EUM-FBB Brake Module

Use for brake alone applications. Mounts between a motor and gear box or reducer. Available in four sizes.

EUM-MBFB Motor Brake Module

Mounts to a double shafted C-face motor. Available in five sizes.

Warner Electric offers the convenience of pre-assembly in UniModule electrically released brake packages. Assembly, alignment, and preburnishing have been done at the factory. Bolt it on, wire it up, and your electrically released brake is ready to go. (Control and conduit box optional)

Care must be exercised to assure proper sizing and selection of electrically released brakes. Motor brakes are used for dynamic stopping and holding of loads when power is removed from the motor. Typical applications include conveyors, process equipment, and lifting devices.

Warner Electric brakes are designed for NEMA C-face motors which match the motor frame size and shaft diameter to the brake. To select a brake, determine the motor frame size and pick an MBFB for double shafted motors or an FBB for mounting between a motor and a gear reducer. Select the torque required for the

application. Higher torque brakes stop loads faster. Lower torque models provide softer stopping to prevent boxes on conveyors from tipping or skidding.

They are sized to provide nominal stopping of a motor in the event of power loss. If your application requires true "Fail safe" braking, the brake must be sized to meet or exceed peak motor torque and placed as close to the load shaft as possible. Peak motor torque can be determined by the formula:

$$\text{Peak Torque} = \frac{(\text{HP} \times 5250)}{\text{Motor Speed}}$$

EUM Series Electrically Released Brakes

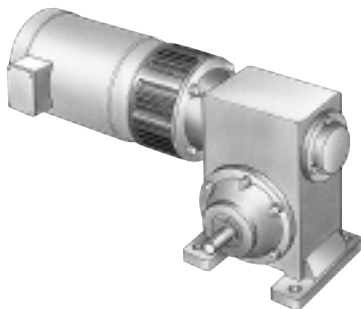
EUM-FBB, EUM-MBFB Selection

Warner Electric Electrically Released Enclosed UniModules are available in two styles. The EUM-FBB Brake Module is used in brake only applications and mounts between a C-face motor and a gear box or reducer. The EUM-MBFB Motor Brake Module mounts to the back of a double shafted motor.

Note: Care must be exercised when selecting a brake to ensure it is sized properly for your application.

1. Select Configuration

a. FBB for NEMA C-face Mounting Between a Motor and Reducer



Verify that the brake will be cycled frequently.

Determine the NEMA C-face frame size of your motor and/or reducer, and choose the corresponding size Enclosed UniModule from the Frame Size Selection chart.

Size EUM-100 modules utilize a 5/8" diameter shaft to fit 56C/48Y motor frames with components of EUM-180 units for higher torque and heat dissipation capacity than the EUM-50.

EUM-FBB Frame Size Selection

| NEMA Frame Size | EUM Size |
|-----------------|----------------------|
| 56C/48Y | EUM-50* EUM-100** |
| 182C/143TC | EUM-180 |
| 184C/145TC | EUM-180 |
| 213C/182TC | EUM-210 |
| 215C/184TC | EUM-210 |
| 213TC/215TC | EUM-215 |

*For 56C/48Y C-frame motors 3/4 HP and smaller, the EUM-100 size may be used where extended life is desirable.

**The EUM-100 size is recommended for motors 1 HP and larger.

b. MBFB for NEMA C-face Mounting on the Back of a Double Shafted Motor

Verify that the brake will be cycled frequently.

Determine the NEMA C-face frame size of your motor and/or reducer, and choose the corresponding size Enclosed UniModule MBFB from the Frame Size Selection chart, and verify that the motor shaft diameter and mounting bolt circle are the same for the brake and the motor.

Size EUM-100 modules utilize a 5/8" diameter shaft to fit 56C/48Y motor frames with components of EUM-180 units for higher torque and heat dissipation capacity than the EUM-50.

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

EUM-MBFB Frame Size Selection

| NEMA Frame Size | EUM Brake Size | Bolt Hole Mounting Circle | Motor Shaft Dia. |
|-----------------|----------------------|---------------------------|------------------|
| 56C/48Y | EUM-50* EUM-100** | 5.875 | 0.625 |
| 182C/143TC | EUM-180 | 5.875 | 0.875 |
| 184C/145TC | EUM-180 | 5.875 | 0.875 |
| 213C/182TC | EUM-210-7/8 | 7.25 | 0.875 |
| 215C/184TC | EUM-210 | 7.25 | 1.125 |

*For 56C/48Y C-frame motors 3/4 HP and smaller, the EUM-100 size may be used where extended life is desirable.

**The EUM-100 size is recommended for motors 1 HP and larger.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|---|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1/2 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 3/4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 1-1/2 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 2 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 3 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 5 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 7-1/2 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 10 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

EUM Series Electrically Released Brakes

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100)^2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

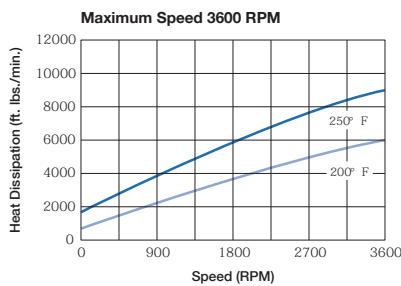
N = Speed in revolutions per minute. (RPM)

F = Cycle rate in cycles per minute (CPM)

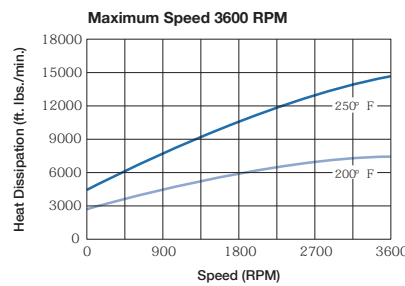
Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Heat Dissipation Curves

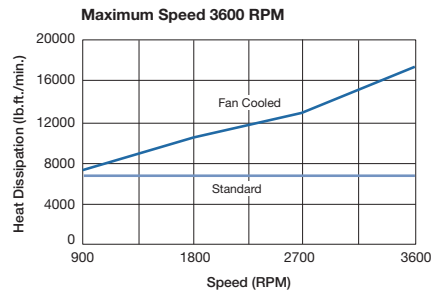
Size 50



Size 100/180



EUM 210/215 (fan not available for 215)



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart on page 153. Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the technical ratings chart to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

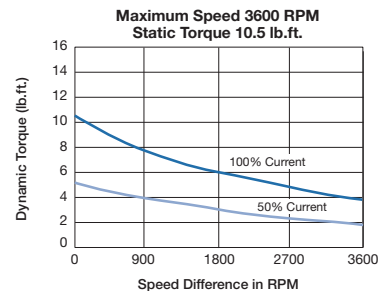
WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute. (RPM)

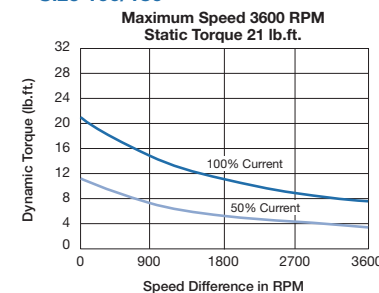
t = Time allowed for the engagement (sec)

C-face Electrically Released Brakes Dynamic Torque Curves

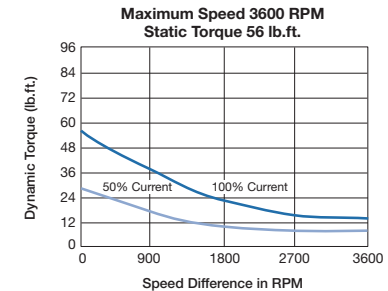
Size 50



Size 100/180



Size 210/215



EUM Series Electrically Released Brakes

Preassembled, Totally Enclosed, Electrically Released Brake Units

Specifications

| Size | Voltage DC | Static Torque (lb.ft.) | Max. Speed (RPM) | Total Weight (lbs.) | Armature (lb.ft. ²) | Component Inertia -WR ² (lb.ft. ²) | | | | NEMA Frame Size |
|------|------------|------------------------|------------------|---------------------|---------------------------------|---|-------|-------------|-------------|--------------------------|
| | | | | | | FBB | | MBFB | | |
| | | | | | | Hub | Shaft | Hub Spliced | Shaft Input | |
| 50 | 90 | 6 | 3600 | 8.6 | .009 | .001 | .0005 | .001 | .0003 | 56C/48Y |
| 100 | 90 | 12 | 3600 | 10.5 | .023 | .002 | .002 | .002 | .002 | 56C/48Y |
| 180 | 90 | 12 | 3600 | 10.5 | .023 | .002 | .002 | .002 | .002 | 182C/143TC 184C/145TC |
| 210 | 90 | 32 | 3600 | 27 | .081 | .016 | .016 | .016 | .007 | 213C/182TC 215C/184TC |

3. Select Options

Warner Electric Enclosed UniModules can be fitted with several accessories to extend their capacity and ease of mounting.

4. Select Control

All electrically released modules require a control with a potentiometer that will vary brake channel output. For FBB and MBFB brake modules, the CBC-160, CBC-200, CBC-300, or CBC-500/550 is recommended. The FBC units require either a CBC-300 or a CBC 500/550 control.

EUM Series Electrically Released Brakes

Selection/Ordering Information

Selection Procedure

Note: Care must be exercised when selecting the proper brake size for your application.

The selection charts list NEMA motor frame sizes, motor shaft diameters, and the matching FBB or MBFB brakes.

To select a brake:

1. Determine the motor NEMA C-face frame size.
2. Select brake configuration
 - a. FBB to mount between a NEMA C-face motor and a gear reducer.
 - b. MBFB to mount on double shafted NEMA C-face motors.
3. Select the brake model from the charts by the torque required – higher torque for faster stopping, lower torque for longer, “soft” stopping.

Note: Size 100 brakes are typically used on motors with a rating of 1 HP or greater.

4. **Important:** Verify that the motor shaft diameter and mounting bolt circle dimensions are the same for the brake selected and the motor.

Control Selection

An optional conduit box enclosure is available. All electrically released units require a control with a potentiometer to vary brake channel output. For FBB and MBFB brake modules, control models CBC-160, CBC-200, CBC-300, or CBC-500/550 are recommended. (See Controls Section.)

Frame Size

| EUM Size | NEMA Frame Size | Bolt Hole Mounting Circle | FBB Motor to Reducer Shaft Dia. | MBFB Motor Brake Shaft Dia. |
|-------------|-----------------|---------------------------|---------------------------------|-----------------------------|
| EUM-50 | 56C | 5 7/8 | 5/8 | 5/8 |
| EUM-100 | 56C | 5 7/8 | 5/8 | 5/8 |
| EUM-180 | 143TC 145TC | 5 7/8 | 7/8 | 7/8 |
| EUM-210-7/8 | 213TC 215TC | 7 1/4 | N/A | 7/8 |
| EUM-210 | 182TC 184TC | 7 1/4 | 1 1/8 | 1 1/8 |
| EUM-215 | 213TC 215TC | 7 1/4 | 1 3/8 | N/A |

How to Order

1. Specify model number and voltage or the corresponding part number.
2. Specify conduit box, if desired. See the Controls Section.
3. Specify required control unit. See the Controls Section.

Ordering Example

EUM-50-20FBB-6, 90V or 5370-169-983; 5370-101-042 conduit box; CBC-160-2 control.

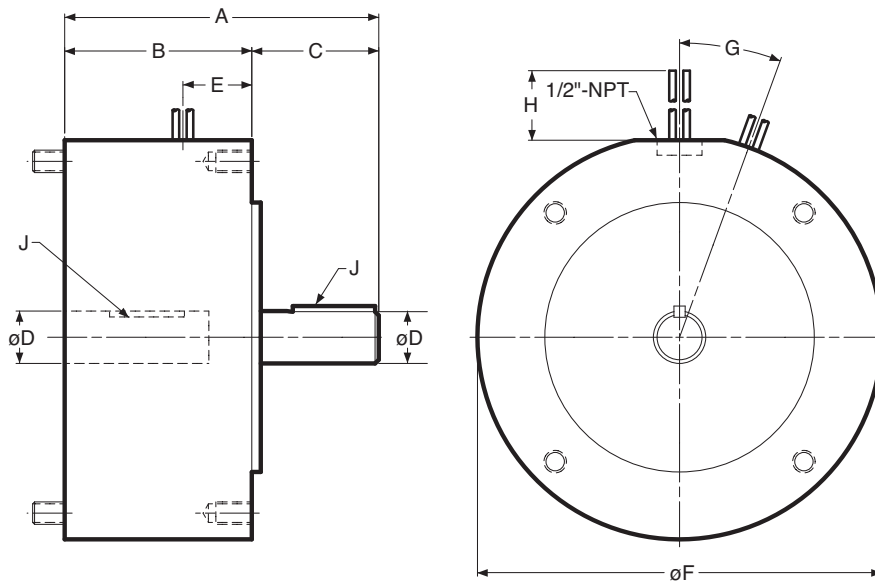
| Totally Enclosed EUM Model No. | Voltage D.C. | Original Design Part No. | COMBINED GEN 2 Part No. OR | | SEPARATE GEN 2 Part Numbers | |
|--------------------------------|--------------|--------------------------|----------------------------|--------------|-----------------------------|--------------|
| | | | UniModule w/kit | | UniModule and | Cover Kit |
| EUM Series | | | | | | |
| EUM-50-20FBB-6 | 90 | 5370-169-983 | 5370-169-260 | | | N/A |
| EUM-100-20FBB-12 | 90 | 5370-169-989 | 5370-169-261 | | | N/A |
| EUM-180-20FBB-12 | 90 | 5370-169-995 | 5370-169-262 | | | N/A |
| EUM-210-20FBB-32 | 90 | 5371-169-078 | N/A | | | N/A |
| EUM-210-20FBB-56 | 90 | 5371-169-082 | N/A | | | N/A |
| EUM-215-20FBB-32 | 90 | 5371-169-086 | N/A | | | N/A |
| EUM-215-20FBB-56 | 90 | 5371-169-090 | N/A | | | N/A |
| EUM-50-20MBFB-6 | 90 | 5370-169-965 | 5370-169-263 | | | N/A |
| EUM-100-20MBFB-12 | 90 | 5370-169-971 | 5370-169-264 | | | N/A |
| EUM-180-20MBFB-12 | 90 | 5370-169-977 | 5370-169-265 | | | N/A |
| EUM-50-20FBB-10 | 90 | 5370-169-986 | 5370-32 | 5370-169-279 | and | 5370-101-082 |
| EUM-100-20FBB-21 | 90 | 5370-169-992 | 5370-33 | 5370-169-284 | and | 5370-101-082 |
| EUM-180-20FBB-21 | 90 | 5370-169-998 | 5370-34 | 5370-169-289 | and | 5370-101-082 |
| EUM-50-20MBFB-10 | 90 | 5370-169-968 | 5370-35 | 5370-169-249 | and | 5370-101-082 |
| EUM-100-20MBFB-21 | 90 | 5370-169-974 | 5370-36 | 5370-169-254 | and | 5370-101-082 |
| EUM-180-20MBFB-21 | 90 | 5370-169-980 | 5370-37 | 5370-169-259 | and | 5370-101-082 |
| EUM-210-7/8-20MBFB-32 | 90 | 5371-169-064 | N/A | | | N/A |
| EUM-210-7/8-20MBFB-56 | 90 | 5371-169-068 | N/A | | | N/A |
| EUM-210--20MBFB-32 | 90 | 5371-169-056 | N/A | | | N/A |
| EUM-210-20MBFB-56 | 90 | 5370-169-060 | N/A | | | N/A |

Accessories

| Description | FBB Size | Part No. |
|-----------------------------------|------------|--------------|
| Conduit Box | FBB series | 5370-101-042 |
| | All sizes | |
| Motor Mount Kit for 20 FBB | 50/100/180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |

EUM-FBB Series Electrically Released Brakes

EUM-FBB Brake Module



Dimensions (Blue shaded areas indicate GEN 2 design)

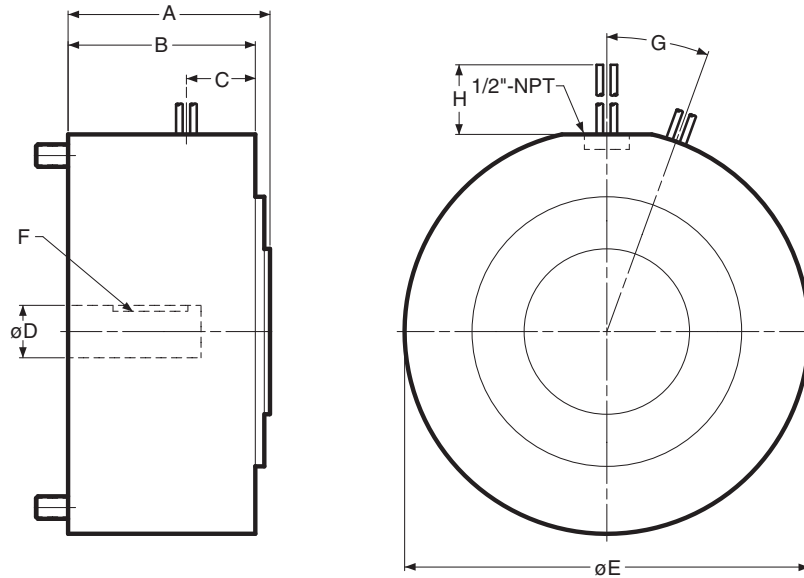
| Size | A | B | C | D | E | F | G | H | J |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 5.165 | 3.125 | 2.040 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 5.186 | 3.125 | 2.061 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 5.246 | 3.125 | 2.121 | .875 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 7.578 | 4.609 | 2.500 | 1.125 | 1.812 | 9.250 | 20° | 36 | 1/4 x 1/4 |
| 215 | 8.078 | 4.609 | 3.000 | 1.375 | 1.812 | 9.250 | 20° | 36 | 5/16 x 5/16 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 and 215 sizes will continue to be offered in the original design and will not be converted.

EUM-MBFB Series Electrically Released Brakes

EUM-MBFB Motor Brake Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|---------|-------|-------|-------|-------|-------|-------------|-----|----|
| 50 | 3.368 | 3.125 | 1.150 | .625 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 100 | 3.368 | 3.125 | 1.150 | .625 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 180 | 3.368 | 3.125 | 1.150 | .875 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 210 7/8 | 5.150 | 4.610 | 1.812 | .875 | 9.250 | 3/16 x 3/16 | 20° | 36 |
| 210 | 5.150 | 4.610 | 1.812 | 1.125 | 9.250 | 1/4 x 1/4 | 20° | 36 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EM Series Electrically Released Brakes

For Dynamic Stopping and Cycling Applications

Warner Electric's modular design brakes and clutch/brake units offer material handling system users a high performance alternative to spring-set brakes. These modular units provide long life, maintenance free operation, and consistent performance with minimal downtime.

These brakes are offered in power-off types for double shaft motors and for installation between C-face motor and reducer or other drive device. Powerful permanent magnets generate braking torque. The brakes release when voltage is applied to the coil, countering the force of the permanent magnets. No power is required to stop or hold a load. An optional integral conduit box provides simple wiring direct from the motor power leads.

- Designed for dynamic stopping operations
- Brake automatically engages when power is turned off
- High cycle rate capability
- Never needs adjustment – automatically compensates for wear
- Powerful permanent magnets provide braking force
- Choice of open or enclosed brakes
- Prepackaged, preburnished UM version

Three C-face Compatible Designs

The UM Series (UniModule Clutch/Brakes) are preassembled clutch/electrically released brake modules.

- The UM-1020-FBC brake/motor clutch combination is used for clutch/power-off brake applications. It mounts directly to C-face compatible components.
- The UM-2030-FBC brake/input clutch combination is used for clutch/power-off brake applications. It has shafts on both the input and output sides for base mounting.

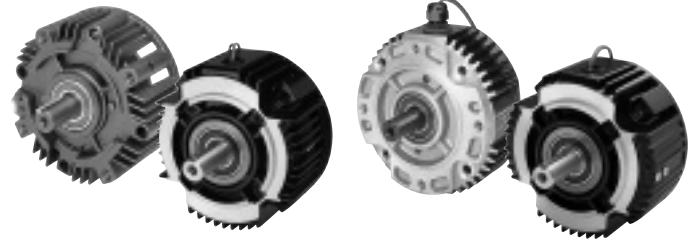
The EUM Series (Enclosed Motor Brakes) are totally enclosed non-vented units that keep wear particles in and contaminants out.

- The EUM-FBB brake unit can be mounted between two C-face compatible components.
- The EUM-MBFB motor brake is mounted directly to the rear of a double-shafted motor.

The EM Series (Electro Module Brakes and Clutch/Brakes) are comprised of individual units that may bolt together to form various combinations:

- The EM-FBB brake module mounts between a C-face motor and a gear box or reducer.
- The EM-MBFB motor brake module is mounted to the rear of a double-shafted motor.
- The EM-FBC brake module is used in combination with a motor clutch or input clutch unit to make a clutch/electrically released brake or can be used alone as a brake only.

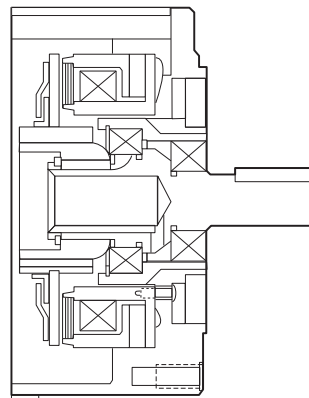
Brake Modules (FBB) – For mounting between a C-face motor and a gearbox or reducer



EM Series
Shaft mounted,
vented housing

EUM Series
Shaft mounted,
totally enclosed
non-vented housing

Use for brake alone applications.



Features

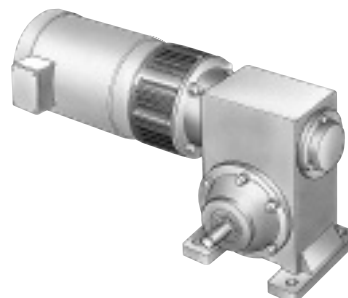
- Single armature for brake alone applications
- Output shaft
- Permanent magnets
- UL listed

EM-FBB

Available in 5 sizes

EUM-FBB

Available in 5 sizes

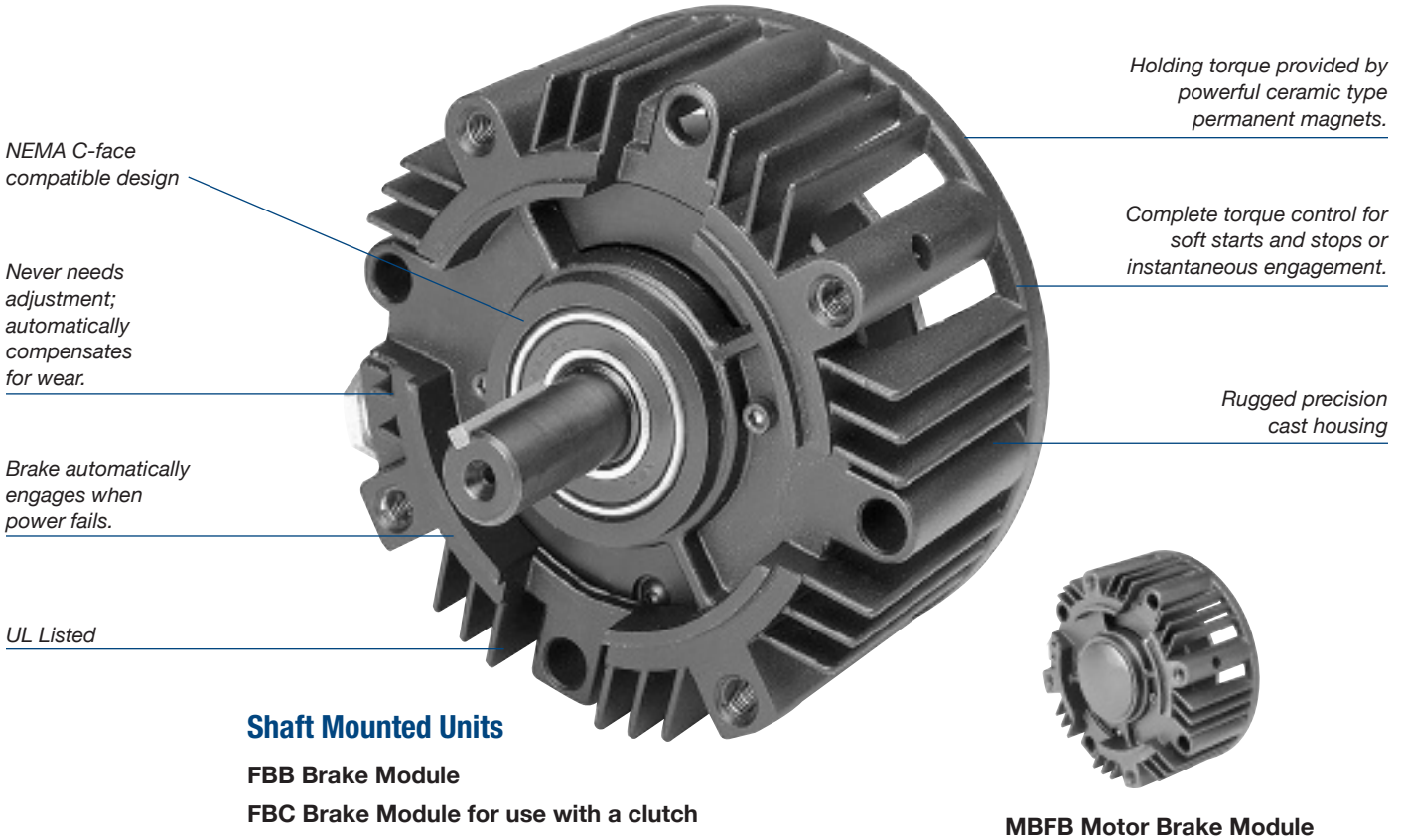


EM-FBB Electro Module
brake unit between a
motor and a reducer.

EM Series Electrically Released Brakes

Electro Module, Electrically Released Brakes and Clutch/Brake Units for Dynamic Stopping and Cycling Applications

210 and 215 sizes



Warner Electric's unique design employs powerful permanent magnets for maximum torque when power is removed from the brake coil. A small amount of electrical power applied to the brake coil nullifies the permanent magnets' force and the brake releases. No springs to limit cycle rates. Never need adjustment. No lubrication. These brakes are recommended for dynamic cycling operations only.

Available in Three Design Styles

EM-FBB Brake Module

Use for brake alone applications. Mounts between a C-face motor and a gear box or reducer. Available in five sizes.

EM-MBFB Motor Brake Module

Mounts to the back of a double shafted motor. Available in four sizes.

EM-FBC Brake Module for use with a Clutch

Combine with a motor or input clutch for clutch/brake applications. Three sizes are available.

Specifications

| Size | Voltage DC | Static Torque (lb.ft.) | | Max. Speed (RPM) | Total Weight (lbs.) | Component Inertia -WR ² (lb.ft. ²) | | | | NEMA Frame Size |
|--------|------------|------------------------|--------|------------------|---------------------|---|------|------|-------|--------------------------|
| | | Brake | Clutch | | | Armature | | Hub | Shaft | |
| | | | | | | FBB/MBFB | FBC | | | |
| EM-50 | 24 90 | 10.5 | 16 | 3600 | 8.6 | .0071 | .014 | .003 | .001 | 56C/48Y |
| EM-100 | 90 | 21 | — | 3600 | 10.5 | .018 | — | .004 | .002 | 56C/48Y |
| EM-180 | 24 90 | 21 | 30 | 3600 | 10.5 | .018 | .036 | .004 | .002 | 182C/143TC 184C/145TC |
| EM-210 | 24 90 | 56 | 95 | 3600 | 27 | .081 | .162 | .027 | .017 | 213C/182TC 215C/184TC |

EM Series Electrically Released Brakes

C-face Compatible Brakes and Clutch/Brakes

Motor Brake Modules (MBFB)

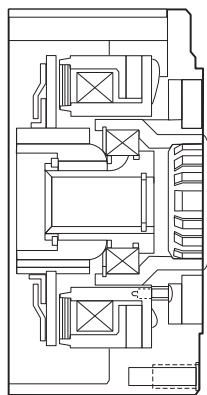
For mounting directly to the rear of a double-shafted motor



EM Series
vented housing

EUM Series
totally enclosed
non-vented
housing

Use as a motor brake on C-face type motors.



Features

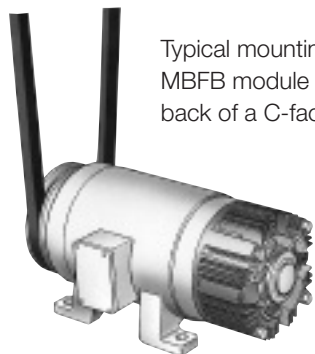
- Single armature design
- Complete torque control
- Precision cast housing
- Ceramic type permanent magnets

EM-MBFB

Available in 5 sizes

EUM-MBFB

Available in 5 sizes



Typical mounting of an MBFB module on the back of a C-face motor

Clutch/Brake Modules (FBC)

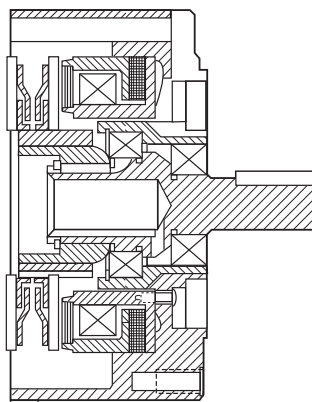
Clutch/Fail-safe brake for mounting between a C-face motor and a gearbox or reducer



EM Series
Modular unit with
C/B capability

UM Series
Fully assembled
C/B combination
package

Combine with a motor or input clutch for clutch/brake applications or use alone as a brake only.



Features

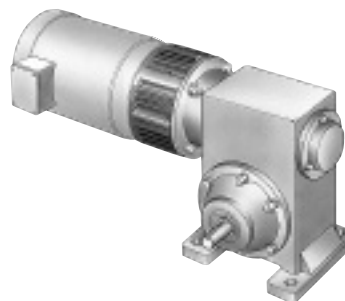
- Dual armature for clutch/brake combination
- Output shaft
- Can be base mounted for use as a separate drive unit.

EM-FBC

Available in 4 sizes

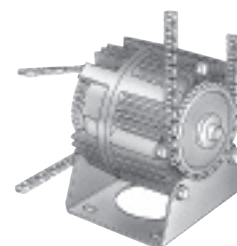
UM-FBC

Available in 5 size combinations



EM-FBC Electro Module brake unit combined with a motor clutch module

UM-FBC UniModule
clutch/brake mounted
on a base



EM Series Electrically Released Brakes

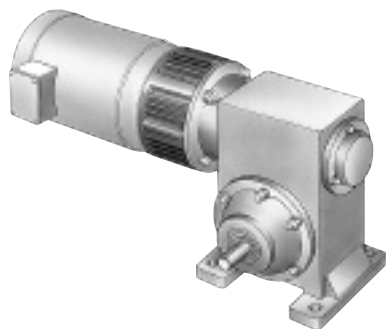
EM-FBB, EM-FBC, EM-MBFB Selection

Warner Electric Electrically Released Electro Modules are available in three styles. The EM-FBB Brake Module is used in brake only applications and mounts between a C-face motor and a gear box or reducer. The EM-MBFB Motor Brake Module mounts to the back of a double shafted motor. The EM-FBC Brake Module is combined with a motor clutch (EM-10) or an input clutch (EM-30) for clutch/electrically released brake applications.

Note: Care must be exercised when selecting a brake to ensure it is sized properly for your application.

1. Select Configuration

a. For FBB and MBFB Modules NEMA C-face Mounting



Verify that the brake will be cycled frequently.

Determine the NEMA C-face frame size of your motor and/or reducer, and choose the corresponding size Electro Module from the Frame Size Selection chart.

Size EM-100 modules utilize a 5/8" diameter shaft to fit 56C/48Y motor frames with components of EM-180 units for higher torque and heat dissipation capacity than the EM-50.

Select Brake Configuration: use an EM-FBB for mounting between a motor and a reducer; or an EM-MBFB for mounting on the rear of a double shafted motor.

NOTE: When selecting an MBFB, ensure the shaft dimensions on the rear of the motor are compatible with the EM-MBFB unit selected.

b. For FBC Modular Units, NEMA C-face Mounting

Verify that brake will be cycled frequently, and will be used with a motor mounted clutch (EM-10) for C-face mounting.

Determine the NEMA C-face frame size of your motor and/or reducer, and choose the corresponding size Electro Module from the Frame Size Selection chart.

FBC Frame Size Selection

| NEMA Frame Size | EM Size |
|--------------------------|--------------------|
| 56C/48Y | EM-50* EM-100** |
| 182C/143TC 184C/145TC | EM-180 |
| 213C/182TC 215C/184TC | EM-210 |

For torque ratings, refer to the "Specifications" chart. Note that separate torque ratings are listed for the clutch and brake segments of the module.

* For 56C/48Y C-frame motors 3/4 HP and smaller, the EM-100 size may be used where extended life is desirable.

** The EM-100 size is recommended for motors 1 HP and larger.

c. For FBC Modular Units, Base Mounting



Verify that brake will be cycled frequently, and will be used with an input clutch (EM-30) for base mounting.

Select the correct size module from the Horsepower vs. Shaft Speed chart (at the bottom of this page) by determining the motor horsepower and RPM at the module location. The correct size EM is shown at the intersection of the HP and operating speed. For additional sizing information, refer to the technical sizing procedure (step 2).

FBB AND MBFB Frame Size Selection

| NEMA Frame Size | EM Size |
|--------------------------|--------------------|
| 56C/48Y | EM-50* EM-100** |
| 182C/143TC 184C/145TC | EM-180 |
| 213C/182TC 215C/184TC | EM-210 |
| 213TC/215TC | EM-215 |

*For 56C/48Y C-frame motors 3/4 HP and smaller, the EM-100 size may be used where extended life is desirable.

**The EM-100 size is recommended for motors 1 HP and larger.

Horsepower vs. Shaft Speed

| HP | SHAFT SPEED AT CLUTCH (IN RPM) | | | | | | | | | | | | | | | | | | |
|-------|--------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------------------|------|------|------|------|--|
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1500 | 1800 | 2000 | 2400 | 3000 | 3600 | |
| 1/4 | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | | | | | | | | | | | | EM-50 | | | | | |
| 3/4 | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | | | | | | | | | | | | | | EM-100 or EM-180 | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | |
| 7-1/2 | | | | | | | | | | | | | | | | | | | |

2. Determine Technical Requirements

Technical considerations for sizing and selection are torque and heat dissipation. Each merits careful consideration, especially heat dissipation as over time, use in excessive temperature environments will have an adverse effect on bearing life and coil wire insulation integrity.

Compare the calculated torque requirement with the average dynamic torque ratings. Select a unit with adequate torque. If the unit selected on torque is different than the unit selected based on heat, select the larger size unit.

a. Heat Dissipation Sizing

Friction surfaces slip during the initial period of engagement and, as a result, heat is generated. The clutch/brake selected must have a heat dissipation rating greater than the heat generated by the application. Therefore, in high inertia or high cycle rate applications, it is necessary to check the heat dissipation carefully. Inertia, speed and cycle rate are the required parameters.

Heat dissipation requirement is calculated as follows:

$$E = 1.7 \times WR^2 \times (N/100) \times 2 \times F$$

where:

$$E = \text{Heat (lb. ft./min.)}$$

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb.ft.²)

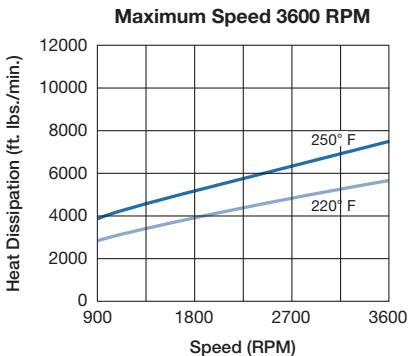
N = Speed in revolutions per minute. (RPM)

F = Cycle rate in cycles per minute (CPM)

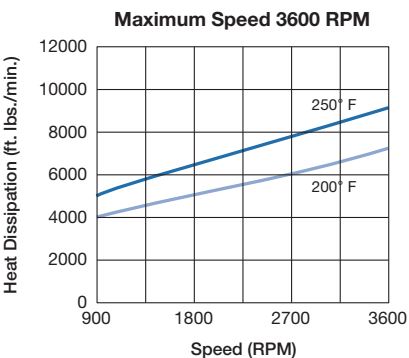
Compare the calculated heat generated in the application to the unit ratings using the heat dissipation curves. Select the appropriate unit that has adequate heat dissipation ability.

Heat Dissipation Curves

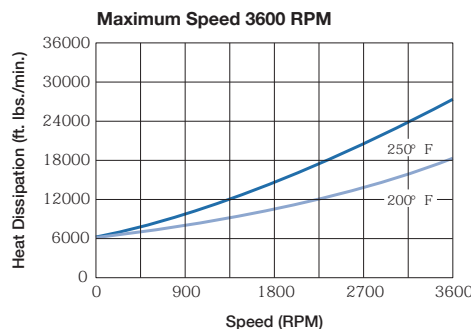
Size 50



Size 100/180



Size 210/215



b. Torque Sizing

For most applications, the correct size clutch/brake can be selected from the Horsepower vs. Shaft Speed chart on page 162. Determine the motor horsepower and the RPM at the clutch/brake. The correct size unit is shown at the intersection of horsepower and shaft speed.

If the static torque requirements are known, refer to the technical ratings chart to select a unit.

For some applications, the torque requirement is determined by the time allowed to accelerate and decelerate the load. (This time is generally specified in milliseconds.) For these applications, it is necessary to determine the torque requirement based on load inertia and the time allowed for engagement.

The torque requirements are calculated as follows:

$$T = (WR^2 \times N) / (308 \times t)$$

where:

T = Average Dynamic Torque (lb. ft.)

WR^2 = Total reflected inertia at the clutch/brake shaft. Include the clutch/brake output inertia. (lb. ft.²)

N = Speed in revolutions per minute (RPM)

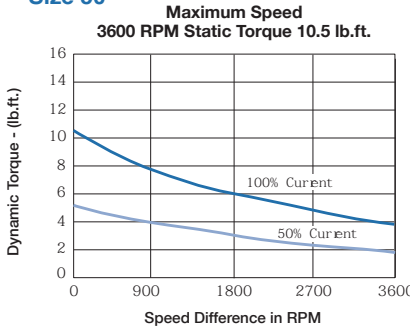
t = Time allowed for the engagement (sec)

EM Series Electrically Released Brakes

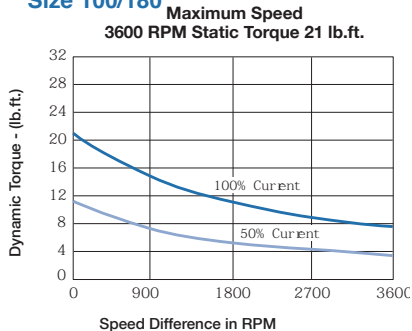
Ordering Information

C-face Electrically Released Brakes Dynamic Torque Curves

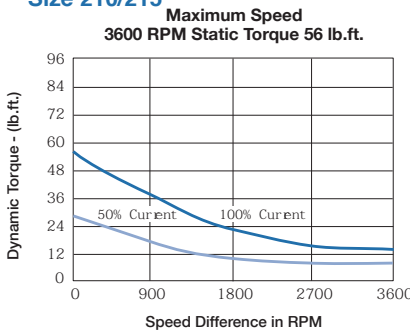
Size 50



Size 100/180



Size 210/215



3. Select Accessories

Warner Electric Electro Modules can be fitted with several accessories to extend their capacity and ease of mounting.

4. Select Control

All electrically released modules require a control with a potentiometer that will vary brake channel output. For FBB and MBFB brake modules, the CBC-160, CBC-200, CBC-300, or CBC-500/550 is recommended. The FBC units require either a CBC-300 or a CBC 500/550 control.

How to Order

1. Specify model number and voltage or the corresponding part number.
2. Specify conduit box, if desired.
3. Specify required control. See the Controls Section (page 201).

Ordering Example

EM-50-20FBB, 90V or 5370-169-234;
5370-101-042 conduit box;
CBC-160-2 control.

Part Numbers (Blue shaded areas indicate GEN 2 design)

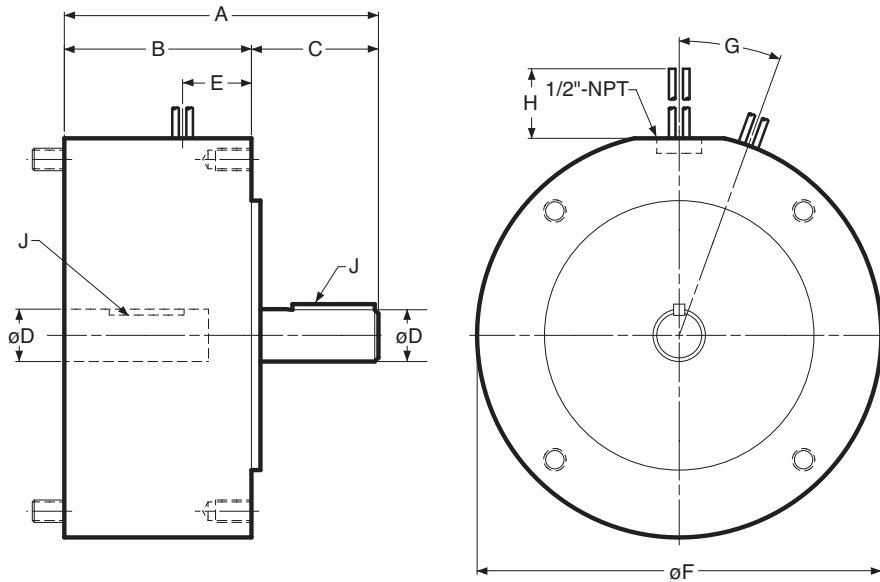
| Model No. | Voltage DC | GEN 2 Part No. | Original Part No. |
|--|------------|----------------|-------------------|
| FBB Brake Module for use as brake only | | | |
| EM-50-20FBB | 24 | 5370-169-278 | 5370-169-066 |
| EM-50-20FBB | 90 | 5370-169-279 | 5370-169-058 |
| EM-100-20FBB | 24 | 5370-169-283 | 5370-169-020 |
| EM-100-20FBB | 90 | 5370-169-284 | 5370-169-084 |
| EM-180-20FBB | 24 | 5370-169-288 | 5370-169-068 |
| EM-180-20FBB | 90 | 5370-169-289 | 5370-169-059 |
| EM-210-20FBB | 24 | | 5371-169-032 |
| EM-210-20FBB | 90 | | 5371-169-029 |
| EM-215-20FBB | 24 | | 5371-169-100 |
| EM-215-20FBB | 90 | | 5371-169-054 |
| FBC Brake Module for use with EM clutch | | | |
| EM-50-20FBC | 24 | 5370-169-233 | 5370-169-065 |
| EM-50-20FBC | 90 | 5370-169-234 | 5370-169-056 |
| EM-100-20FBC | 24 | 5370-169-238 | 5370-169-109 |
| EM-100-20FBC | 90 | 5370-169-239 | 5370-169-108 |
| EM-180-20FBC | 24 | 5370-169-243 | 5370-169-067 |
| EM-180-20FBC | 90 | 5370-169-244 | 5370-169-057 |
| EM-210-20FBC | 24 | | 5371-169-031 |
| EM-210-20FBC | 90 | | 5371-169-028 |
| MBFB Motor Brake Module | | | |
| EM-50-20MBFB | 24 | 5370-169-248 | 5370-169-063 |
| EM-50-20MBFB | 90 | 5370-169-249 | 5370-169-060 |
| EM-100-20MBFB | 24 | 5370-169-253 | 5370-169-007 |
| EM-100-20MBFB | 90 | 5370-169-254 | 5370-169-085 |
| EM-180-20MBFB | 24 | 5370-169-258 | 5370-169-069 |
| EM-180-20MBFB | 90 | 5370-169-259 | 5370-169-061 |
| EM-210-7/8-20MBFB | 24 | | 5371-169-101 |
| EM-210-7/8-20MBFB | 90 | | 5371-169-072 |
| EM-210-20MBFB | 24 | | 5371-169-033 |
| EM-210-20MBFB | 90 | | 5371-169-030 |

Accessories

| Description | EM Size | Part No. |
|---|------------------------|--------------|
| Conduit Box | EM series All sizes | 5370-101-042 |
| Base Mount Kit for 2030 FBC | 50/100 | 5370-101-004 |
| | 180 | 5370-101-002 |
| | 210/215 | 5371-101-019 |
| Motor Mount Kit for 20 FBB, 1020 FBC | 50/100 | 5370-101-078 |
| | 180 | 5370-101-079 |
| | 210/215 | 5371-101-012 |
| Cover Kit | 50/100/180 | 5370-101-076 |
| | 50/180 (FBB or MBFB) | 5370-101-082 |

EM-FBB Series Electrically Released Brakes

EM-20 FBB Brake Module



Dimensions (Blue shaded areas indicate GEN 2 design)

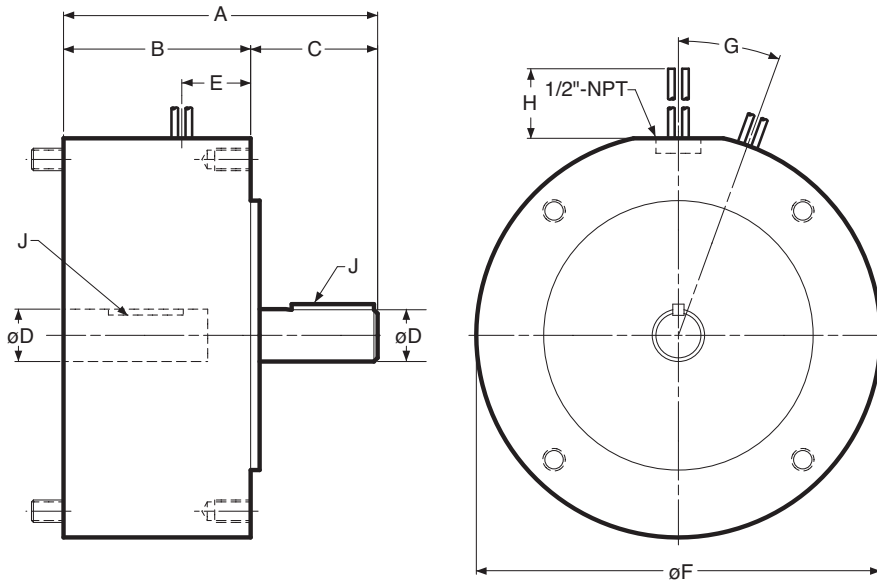
| Size | A | B | C | D | E | F | G | H | J |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|
| 50 | 5.165 | 3.125 | 2.040 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 100 | 5.186 | 3.125 | 2.061 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 180 | 5.246 | 3.125 | 2.121 | .875 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 |
| 210 | 7.578 | 4.609 | 2.500 | 1.125 | 1.812 | 9.250 | 20° | 36 | 1/4 x 1/4 |
| 215 | 8.078 | 4.609 | 3.000 | 1.375 | 1.812 | 9.250 | 20° | 36 | 5/16 x 5/16 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 and 215 sizes will continue to be offered in the original design and will not be converted.

EM-FBC Series Electrically Released Brakes

EM-20FBC Brake Module for use with a Clutch



Dimensions (Blue shaded areas indicate GEN 2 design)

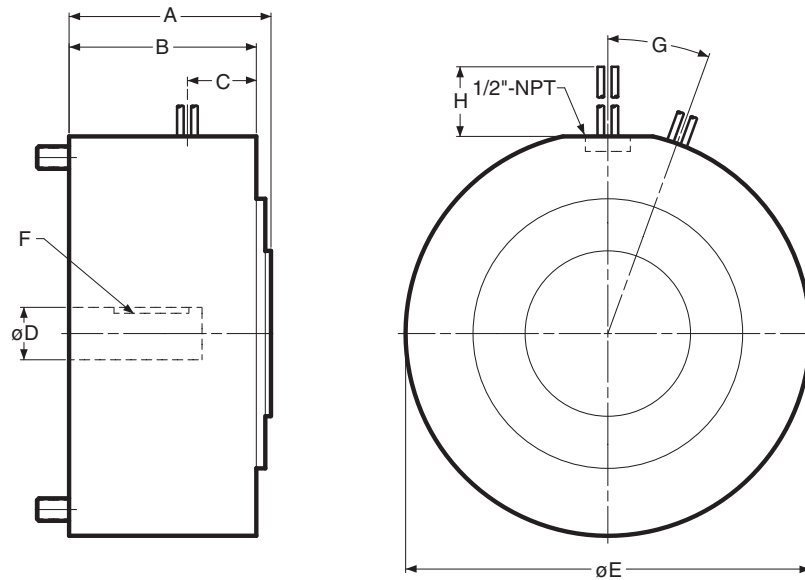
| Size | A | B | C | D | E | F | G | H | J | K |
|------|-------|-------|-------|-------|-------|-------|-----|----|-------------|------|
| 50 | 5.165 | 3.125 | 2.040 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 | — |
| 100 | 5.186 | 3.125 | 2.061 | .625 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 | — |
| 180 | 5.246 | 3.125 | 2.121 | .875 | 1.150 | 6.750 | 0° | 36 | 3/16 x 3/16 | — |
| 210 | 7.578 | 4.609 | 2.500 | 1.125 | 1.812 | 9.250 | 20° | 36 | 1/4 x 1/4 | .785 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design. 210 size will continue to be offered in the original design and will not be converted.

EM-MBFB Series Electrically Released Brakes

EM-20 MBFB Motor Brake Module



Dimensions (Blue shaded areas indicate GEN 2 design)

| Size | A | B | C | D | E | F | G | H |
|---------|-------|-------|-------|-------|-------|-------------|-----|----|
| 50 | 3.368 | 3.125 | 1.150 | .625 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 100 | 3.368 | 3.125 | 1.150 | .625 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 180 | 3.368 | 3.125 | 1.150 | .875 | 6.750 | 3/16 x 3/16 | 0° | 36 |
| 210 7/8 | 5.150 | 4.610 | 1.812 | .875 | 9.250 | 3/16 x 3/16 | 20° | 36 |
| 210 | 5.150 | 4.610 | 1.812 | 1.125 | 9.250 | 1/4 x 1/4 | 20° | 36 |

For standard NEMA frame dimensions, see page 187.

Only 50, 100, and 180 sizes of the models listed will be converted to the new GEN 2 design.
210 size will continue to be offered in the original design and will not be converted.

Enclosed Electro Modules Electrically Released Brakes

Contamination-Proof Design

Clean, quiet, operation. Nothing can get in, nothing can get out. Enclosed design eliminates damage to the working components. Prevents friction wear particles from escaping.

Totally Enclosed Version

The Enclosed Electro Module packages the hardworking components from EM products into a totally enclosed housing. This rugged housing keeps wear particles in and contaminants out and provides quiet operation. Pre-burnished at the factory for rated torque directly out-of-box. When enclosed, they are suitable for most industrial applications and tolerate infrequent, light washing.

- Keeps contaminants out
- Keeps wear particles in
- Quiet operation
- Finned for heat dissipation
- UL listed when optional conduit box is installed

To convert any Gen 2 Electro Module 50, 100, and 180 sizes to an enclosed model purchase optional Cover Kit

(part number 5370-101-076)

(part number 5370-101-082 for brake only)

Enclosed Electro Module Conversion (10-20FBC, 20-30FBC)

An optional cover kit (part number 5370-101-076) can be purchased separately to enclose the open vents in the housing. Each cover kit includes two vent covers, two gaskets and four screws needed to convert a vented Electro Module to an enclosed design (non-washdown).



Enclosed Electro Module-Brake Only (20FBB or 20MBFB)

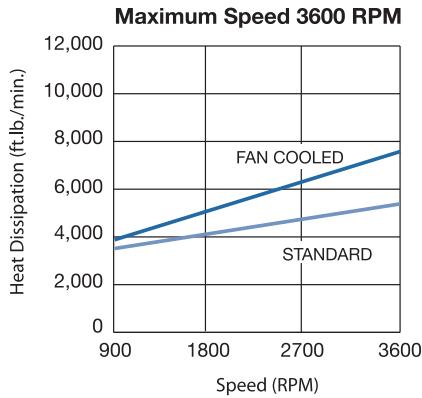
An optional cover kit (part number 5370-101-082) can be purchased separately to enclose the open vents in the housing and a cover plate to close off the back of the module. Each cover kit includes two vent covers, two gaskets, four screws and one cover plate needed to convert a vented Electro Module 20 to an enclosed design (non-washdown).



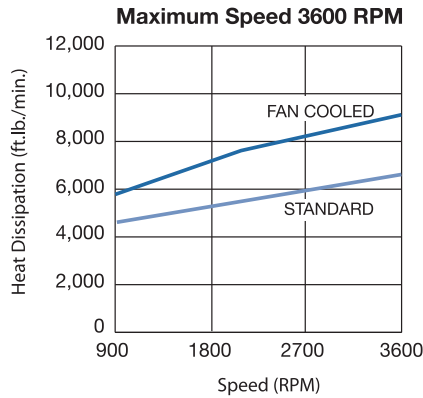
Enclosed Electro Modules Electrically Released Brakes

GEN 2 Heat Dissipation Curves

EUM-50



EUM-100/180



Note: For ORIGINAL DESIGN EUM 50,100 and 180 curves, see page 62.

How To Order

Some GEN 2 EUM models can be ordered in the following two ways:

1. Combined part number, UniModule including cover kit (ex. 5370-15)
2. Separate part numbers, UniModule and cover kit (ex. 5370-273-201 and 5370-101-076)

| Totally Enclosed EUM Model No. | Voltage D.C. | Original Design Part No. | OR | | SEPARATE GEN 2 Part Numbers UniModule and Cover Kit |
|--------------------------------|--------------|--------------------------|---|--|---|
| | | | COMBINED GEN 2 Part No. UniModule w/kit | | |
| EUM Series | | | | | |
| EUM-50-20FBB-6 | 90 | 5370-169-983 | 5370-169-260 | | N/A |
| EUM-100-20FBB-12 | 90 | 5370-169-989 | 5370-169-261 | | N/A |
| EUM-180-20FBB-12 | 90 | 5370-169-995 | 5370-169-262 | | N/A |
| EUM-50-20MBFB-6 | 90 | 5370-169-965 | 5370-169-263 | | N/A |
| EUM-100-20MBFB-12 | 90 | 5370-169-971 | 5370-169-264 | | N/A |
| EUM-180-20MBFB-12 | 90 | 5370-169-977 | 5370-169-265 | | N/A |
| EUM-50-20FBB-10 | 90 | 5370-169-986 | 5370-32 | | 5370-169-279 and 5370-101-082 |
| EUM-100-20FBB-21 | 90 | 5370-169-992 | 5370-33 | | 5370-169-284 and 5370-101-082 |
| EUM-180-20FBB-21 | 90 | 5370-169-998 | 5370-34 | | 5370-169-289 and 5370-101-082 |
| EUM-50-20MBFB-10 | 90 | 5370-169-968 | 5370-35 | | 5370-169-249 and 5370-101-082 |
| EUM-100-20MBFB-21 | 90 | 5370-169-974 | 5370-36 | | 5370-169-254 and 5370-101-082 |
| EUM-180-20MBFB-21 | 90 | 5370-169-980 | 5370-37 | | 5370-169-259 and 5370-101-082 |

UNIBRAKE AC Motor Brakes

Warner Electric UNIBRAKE® decelerates or holds loads when power is off

C-Face, Power-Off Brakes

Single C-Face Power-Off Brakes are designed to decelerate or hold inertia loads when the power is turned off. The single C-Face mounts on the non-driven end of a motor. Brakes are available from 3 ft. lb. to 15 ft. lb.

C-Face, Power-Off Brakes with Heavy-Duty Enclosures

Our Single C-Face Power-Off Brake is also available with cast iron housing for applications involving corrosive environments. The heavy-duty housing also includes o-ring seals to create a dust-tight brake. Brakes are available from 3 ft. lb. to 15 ft. lb.

Double C-Face, Power-Off Brakes

The Double C-Face Brake is designed for use as a coupler between standard C-Face motors and C-Face gear reducers.



UNIBRAKE is available to meet the demands of a wide variety of applications



Applications

The motor brakes are commonly used as parking brakes to hold a load in place or as stopping brakes to dynamically decelerate a load.

Applications include:

- Material Handling
- Food Processing
- Machine Tools

Simple design with fewer moving parts means less downtime

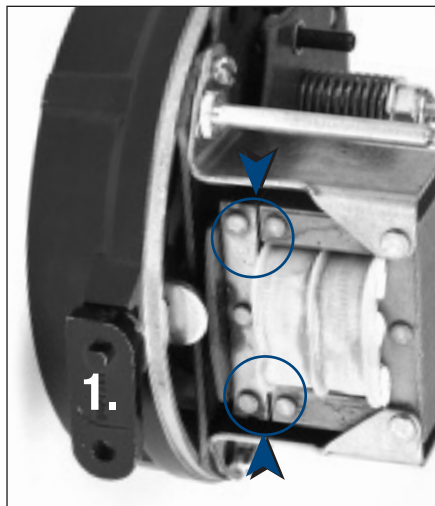


Figure 1:

When the motor is 'off', the driven load can be moved without energizing the motor by rotating the manual release lever 90° clockwise which removes the retarding torque from the motor shaft.

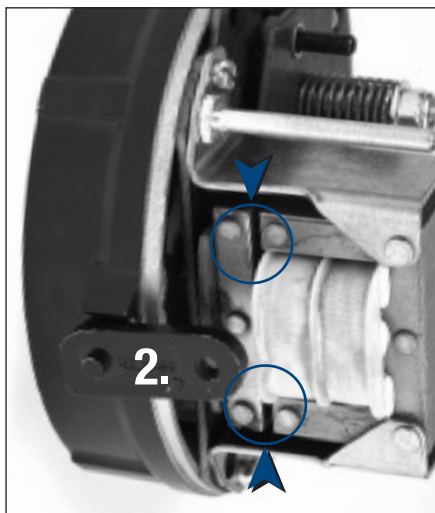


Figure 2:

The lever returns to the normal "set" position when the brake is re-energized.

Spring Applied — Power-Off Operation

Warner Electric spring applied motor brakes are designed to decelerate or park inertial loads when the voltage is turned off, either intentionally or accidentally, as in the case of power failure. The friction disc with the hub is coupled to the motor shaft to be braked but is capable of moving axially. When power is off, a spring force clamps the friction disc between a pressure plate and a stationary plate, hence retarding motion. When an AC voltage is applied, the solenoid creates a Direct Acting magnetic force which releases the friction disk without the use of a linkage. This allows the hub and motor shaft to turn freely.

Features

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full rated torque down to 50%
- Single phase AC coils provide fast engagement and release times and easy wiring.

Mounting

Two styles are available: the single C-Face brake and the double C-Face brake. The single C-Face mounts on the non-driven end of a motor. The C-Face brake is interchangeable with existing brakes and can be used on motors that are modified to accept a brake. The double C-Face brake can be used as a coupler between standard C-Face motors and C-Face gear reducers. All motor brakes are interchangeable with competitive motor brakes.

F Series UNIBRAKES

C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Aluminum Head-Steel Cover

56,000 NEMA 2; 56,100 NEMA 2; 56,300 NEMA 1

Warner Electric Single C-Face Power-Off Brakes are designed to decelerate or hold inertia loads when the power is turned off. The single C-Face mounts on the non-driven end of a motor. Brakes are available from 3 ft. lb. to 15 ft. lb.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- Single-phase AC coils to provide fast release times and easy wiring
- Single C-Face



Brake Part Numbers

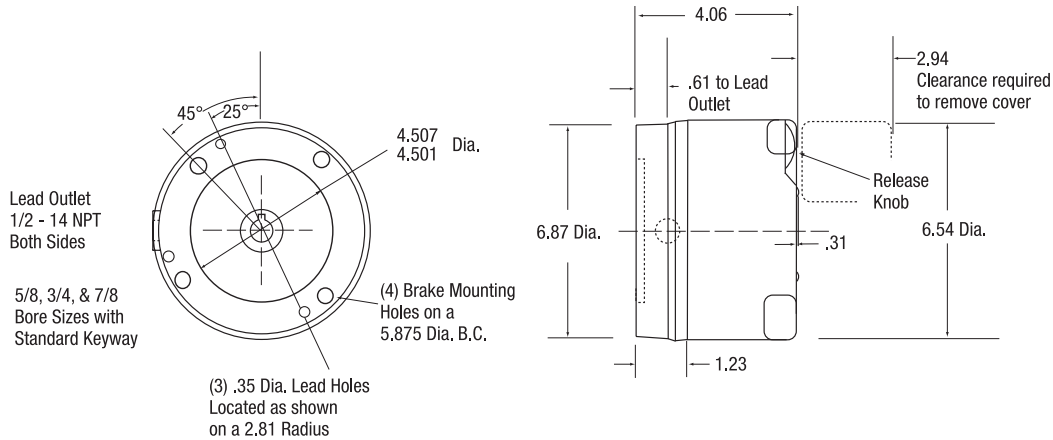
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (1 Disc) | 10 ft. lb. Brakes (2 Discs) | 15 ft. lb. Brakes (3 Discs) | Current Holding Amps | Current Inrush Amps |
|---------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------|------------------------|
| 5/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51A0321-W | F51A0621-W | F52A0721-W | F53A0821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51A0324-W | F51A0624-W | F52A0724-W | F53A0824-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51A0325-W | F51A0625-W | F52A0725-W | F53A0825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51A0328-W | F51A0628-W | F52A0728-W | F53A0828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51A0329-W | F51A0629-W | F52A0729-W | F53A0829-W | .24/.12 | 1.76/.88 |
| 3/4 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51B0321-W | F51B0621-W | F52B0721-W | F53B0821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51B0324-W | F51B0624-W | F52B0724-W | F53B0824-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51B0325-W | F51B0625-W | F52B0725-W | F53B0825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51B0328-W | F51B0628-W | F52B0728-W | F53B0828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51B0329-W | F51B0629-W | F52B0729-W | F53B0829-W | .24/.12 | 1.76/.88 |
| 7/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51C0321-W | F51C0621-W | F52C0721-W | F53C0821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51C0324-W | F51C0624-W | F52C0724-W | F53C0824-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51C0325-W | F51C0625-W | F52C0725-W | F53C0825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51C0328-W | F51C0628-W | F52C0728-W | F53C0828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51C0329-W | F51C0629-W | F52C0729-W | F53C0829-W | .24/.12 | 1.76/.88 |

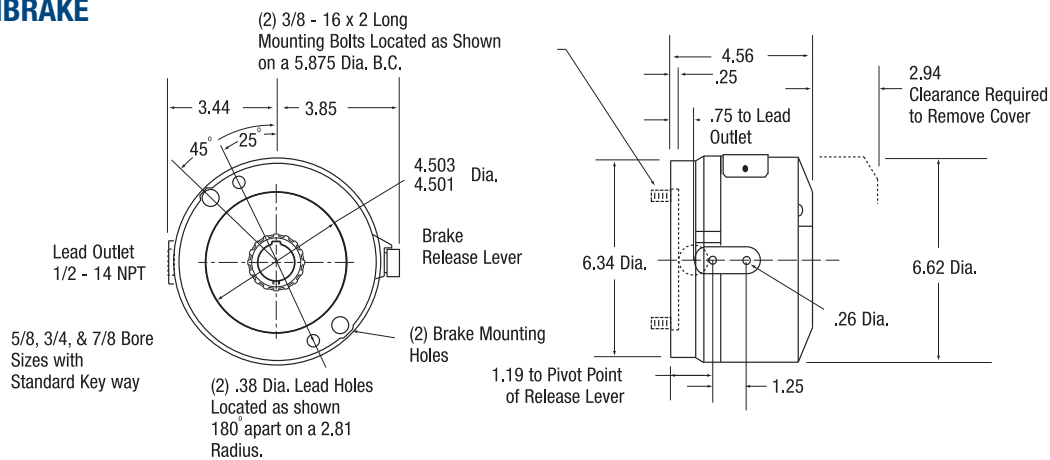
C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Aluminum Head-Steel Cover

56,000 NEMA 2

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

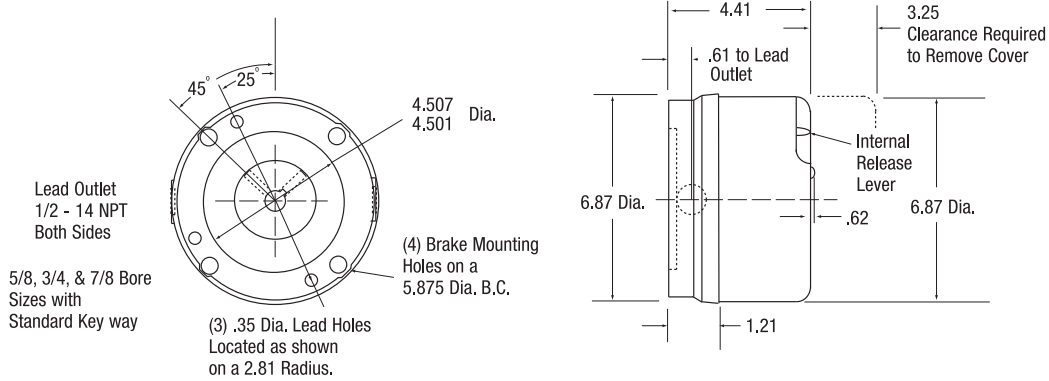
| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|
| 1-056-011-00-BNF | F51A0325-W | 1-056-021-00-CNF | F51B0625-W | 1-056-031-00-DNF | F52C0725-W |
| 1-056-011-00-BOF | F51A0328-W | 1-056-021-00-COF | F51B0628-W | 1-056-031-00-DOF | F52C0728-W |
| 1-056-011-00-BPF | F51A0321-W | 1-056-021-00-CPF | F51B0621-W | 1-056-031-00-DPF | F52C0721-W |
| 1-056-011-00-BQF | F51A0324-W | 1-056-021-00-CQF | F51B0624-W | 1-056-031-00-DQF | F52C0724-W |
| 1-056-011-00-CNF | F51B0325-W | 1-056-021-00-DNF | F51C0625-W | 1-056-041-00-BNF | F53A0825-W |
| 1-056-011-00-COF | F51B0328-W | 1-056-021-00-DOF | F51C0628-W | 1-056-041-00-BOF | F53A0828-W |
| 1-056-011-00-CPF | F51B0321-W | 1-056-021-00-DPF | F51C0621-W | 1-056-041-00-BPF | F53A0821-W |
| 1-056-011-00-CQF | F51B0324-W | 1-056-021-00-DQF | F51C0624-W | 1-056-041-00-BQF | F53A0824-W |
| 1-056-011-00-DNF | F51C0325-W | 1-056-031-00-BNF | F52A0725-W | 1-056-041-00-CNF | F53B0825-W |
| 1-056-011-00-DOF | F51C0328-W | 1-056-031-00-BOF | F52A0728-W | 1-056-041-00-COF | F53B0828-W |
| 1-056-011-00-DPF | F51C0321-W | 1-056-031-00-BPF | F52A0721-W | 1-056-041-00-CPF | F53B0821-W |
| 1-056-011-00-DQF | F51C0324-W | 1-056-031-00-BQF | F52A0724-W | 1-056-041-00-CQF | F53B0824-W |
| 1-056-021-00-BNF | F51A0625-W | 1-056-031-00-CNF | F52B0725-W | 1-056-041-00-DNF | F53C0825-W |
| 1-056-021-00-BOF | F51A0628-W | 1-056-031-00-COF | F52B0728-W | 1-056-041-00-DOF | F53C0828-W |
| 1-056-021-00-BPF | F51A0621-W | 1-056-031-00-CPF | F52B0721-W | 1-056-041-00-DPF | F53C0821-W |
| 1-056-021-00-BQF | F51A0624-W | 1-056-031-00-CQF | F52B0724-W | 1-056-041-00-DQF | F53C0824-W |

F Series UNIBRAKES

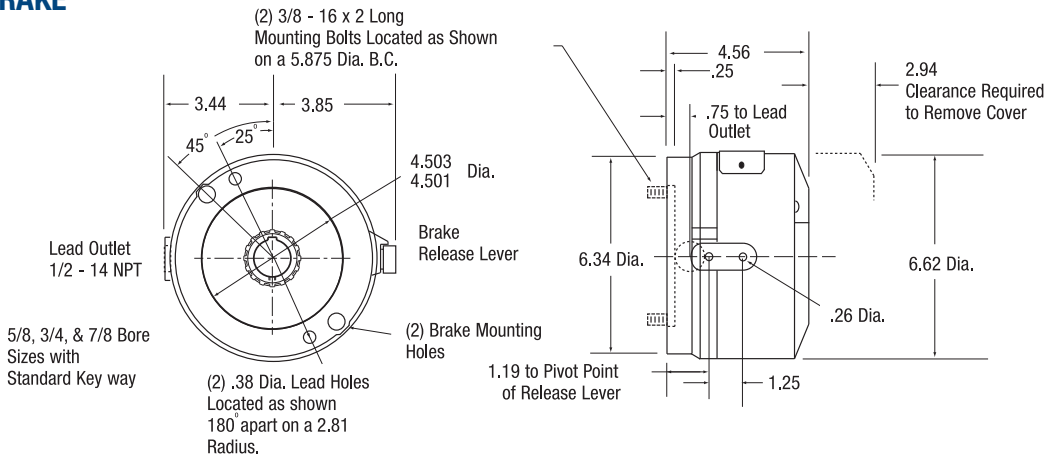
C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Aluminum Head-Steel Cover

56,100 NEMA 2

Stearns®



Warner UNIBRAKE



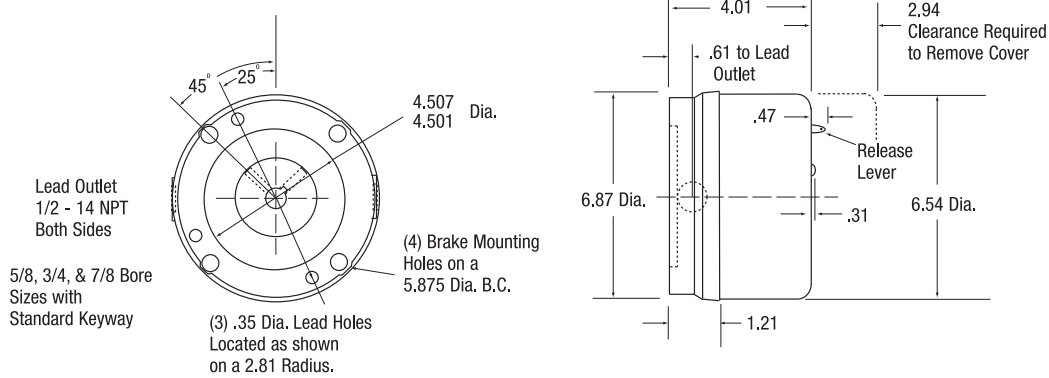
UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|
| 1-056-111-00-BNF | F51A0325-W | 1-056-121-00-CNF | F51B0625-W | 1-056-131-00-DNF | F52C0725-W |
| 1-056-111-00-BOF | F51A0328-W | 1-056-121-00-COF | F51B0628-W | 1-056-131-00-DOF | F52C0728-W |
| 1-056-111-00-BPF | F51A0321-W | 1-056-121-00-CPF | F51B0621-W | 1-056-131-00-DPF | F52C0721-W |
| 1-056-111-00-BQF | F51A0324-W | 1-056-121-00-CQF | F51B0624-W | 1-056-131-00-DQF | F52C0724-W |
| 1-056-111-00-CNF | F51B0325-W | 1-056-121-00-DNF | F51C0625-W | 1-056-141-00-BNF | F53A0825-W |
| 1-056-111-00-COF | F51B0328-W | 1-056-121-00-DOF | F51C0628-W | 1-056-141-00-BOF | F53A0828-W |
| 1-056-111-00-CPF | F51B0321-W | 1-056-121-00-DPF | F51C0621-W | 1-056-141-00-BPF | F53A0821-W |
| 1-056-111-00-CQF | F51B0324-W | 1-056-121-00-DQF | F51C0624-W | 1-056-141-00-BQF | F53A0824-W |
| 1-056-111-00-DNF | F51C0325-W | 1-056-131-00-BNF | F52A0725-W | 1-056-141-00-CNF | F53B0825-W |
| 1-056-111-00-DOF | F51C0328-W | 1-056-131-00-BOF | F52A0728-W | 1-056-141-00-COF | F53B0828-W |
| 1-056-111-00-DPF | F51C0321-W | 1-056-131-00-BPF | F52A0721-W | 1-056-141-00-CPF | F53B0821-W |
| 1-056-111-00-DQF | F51C0324-W | 1-056-131-00-BQF | F52A0724-W | 1-056-141-00-CQF | F53B0824-W |
| 1-056-121-00-BNF | F51A0625-W | 1-056-131-00-CNF | F52B0725-W | 1-056-141-00-DNF | F53C0825-W |
| 1-056-121-00-BOF | F51A0628-W | 1-056-131-00-COF | F52B0728-W | 1-056-141-00-DOF | F53C0828-W |
| 1-056-121-00-BPF | F51A0621-W | 1-056-131-00-CPF | F52B0721-W | 1-056-141-00-DPF | F53C0821-W |
| 1-056-121-00-BQF | F51A0624-W | 1-056-131-00-CQF | F52B0724-W | 1-056-141-00-DQF | F53C0824-W |

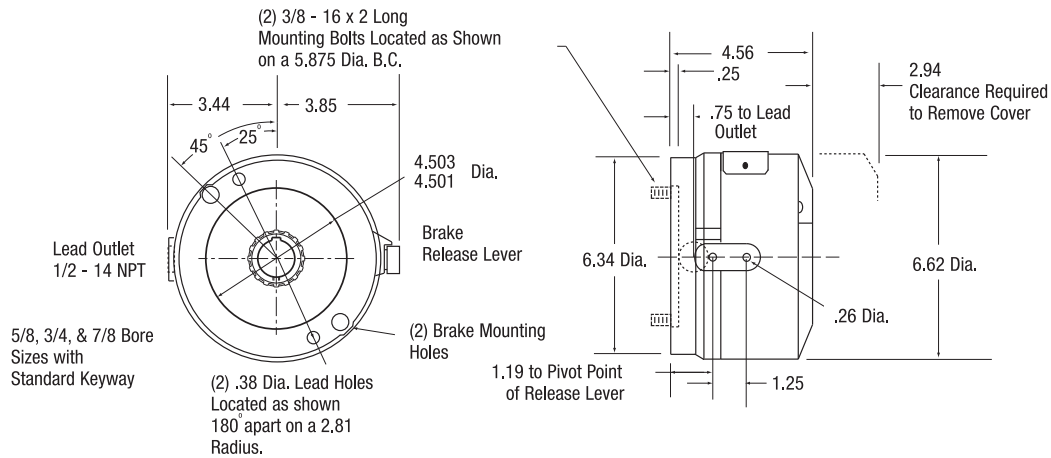
C-Face AC Rear-Mounted Brakes with NEMA 1 Housing Aluminum Head-Steel Cover

56,300 NEMA 1

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|
| 1-056-311-00-BNF | F51A0325-W | 1-056-321-00-CNF | F51B0625-W | 1-056-331-00-DNF | F52C0725-W |
| 1-056-311-00-BOF | F51A0328-W | 1-056-321-00-COF | F51B0628-W | 1-056-331-00-DOF | F52C0728-W |
| 1-056-311-00-BPF | F51A0321-W | 1-056-321-00-CPF | F51B0621-W | 1-056-331-00-DPF | F52C0721-W |
| 1-056-311-00-BQF | F51A0324-W | 1-056-321-00-CQF | F51B0624-W | 1-056-331-00-DQF | F52C0724-W |
| 1-056-311-00-CNF | F51B0325-W | 1-056-321-00-DNF | F51C0625-W | 1-056-341-00-BNF | F53A0825-W |
| 1-056-311-00-COF | F51B0328-W | 1-056-321-00-DOF | F51C0628-W | 1-056-341-00-BOF | F53A0828-W |
| 1-056-311-00-CPF | F51B0321-W | 1-056-321-00-DPF | F51C0621-W | 1-056-341-00-BPF | F53A0821-W |
| 1-056-311-00-CQF | F51B0324-W | 1-056-321-00-DQF | F51C0624-W | 1-056-341-00-BQF | F53A0824-W |
| 1-056-311-00-DNF | F51C0325-W | 1-056-331-00-BNF | F52A0725-W | 1-056-341-00-CNF | F53B0825-W |
| 1-056-311-00-DOF | F51C0328-W | 1-056-331-00-BOF | F52A0728-W | 1-056-341-00-COF | F53B0828-W |
| 1-056-311-00-DPF | F51C0321-W | 1-056-331-00-BPF | F52A0721-W | 1-056-341-00-CPF | F53B0821-W |
| 1-056-311-00-DQF | F51C0324-W | 1-056-331-00-BQF | F52A0724-W | 1-056-341-00-CQF | F53B0824-W |
| 1-056-321-00-BNF | F51A0625-W | 1-056-331-00-CNF | F52B0725-W | 1-056-341-00-DNF | F53C0825-W |
| 1-056-321-00-BOF | F51A0628-W | 1-056-331-00-COF | F52B0728-W | 1-056-341-00-DOF | F53C0828-W |
| 1-056-321-00-BPF | F51A0621-W | 1-056-331-00-CPF | F52B0721-W | 1-056-341-00-DPF | F53C0821-W |
| 1-056-321-00-BQF | F51A0624-W | 1-056-331-00-CQF | F52B0724-W | 1-056-341-00-DQF | F53C0824-W |

F Series UNIBRAKES

C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Cast Iron Head-Steel Cover

56,400 NEMA 2

Warner Electric Single C-Face Power-Off Brakes are designed to decelerate or hold inertia loads when the power is turned off. The single C-Face mounts on the non-driven end of a motor. Brakes are available from 3 ft. lb. to 15 ft. lb.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- Single-phase AC coils to provide fast release times and easy wiring
- Single C-Face



Brake Part Numbers

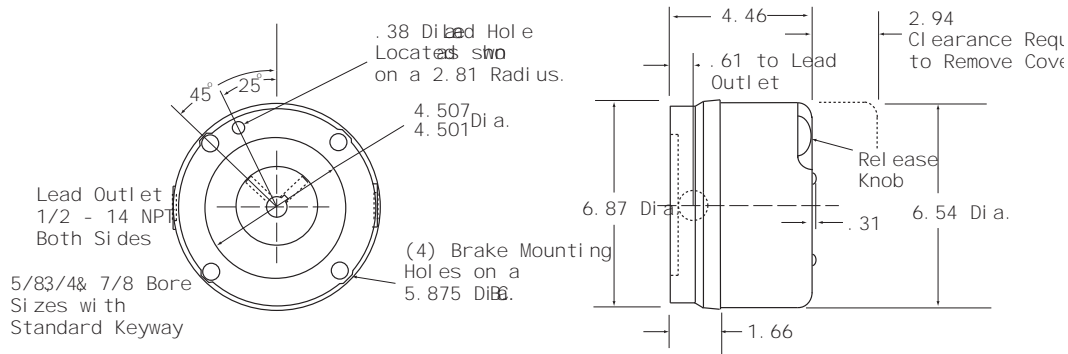
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (1 Disc) | 10 ft. lb. Brakes (2 Discs) | 15 ft. lb. Brakes (3 Discs) | Current Holding Amps | Current Inrush Amps |
|---------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------|------------------------|
| 5/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51A7321-W | F51A7621-W | F52A7721-W | F53A7821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51A7324-W | F51A7624-W | F52A7724-W | F53A7824-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51A7325-W | F51A7625-W | F52A7725-W | F53A7825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51A7328-W | F51A7628-W | F52A7728-W | F53A7828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51A7329-W | F51A7629-W | F52A7729-W | F53A7829-W | .24/.12 | 1.76/.88 |
| 3/4 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51B7321-W | F51B7621-W | F52B7721-W | F53B7821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51B7324-W | F51B7624-W | F52B7724-W | F53B7824-W | .28/.14 | 1.94/.97-W |
| 287/575, 60 HZ | F51B7325-W | F51B7625-W | F52B7725-W | F53B7825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51B7328-W | F51B7628-W | F52B7728-W | F53B7828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51B7329-W | F51B7629-W | F52B7729-W | F53B7829-W | .24/.12 | 1.76/.88 |
| 7/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51C7321-W | F51C7621-W | F52C7721-W | F53C7821-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51C7324-W | F51C7624-W | F52C7724-W | F53C7824-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51C7325-W | F51C7625-W | F52C7725-W | F53C7825-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51C7328-W | F51C7628-W | F52C7728-W | F53C7828-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51C7329-W | F51C7629-W | F52C7729-W | F53C7829-W | .24/.12 | 1.76/.88 |

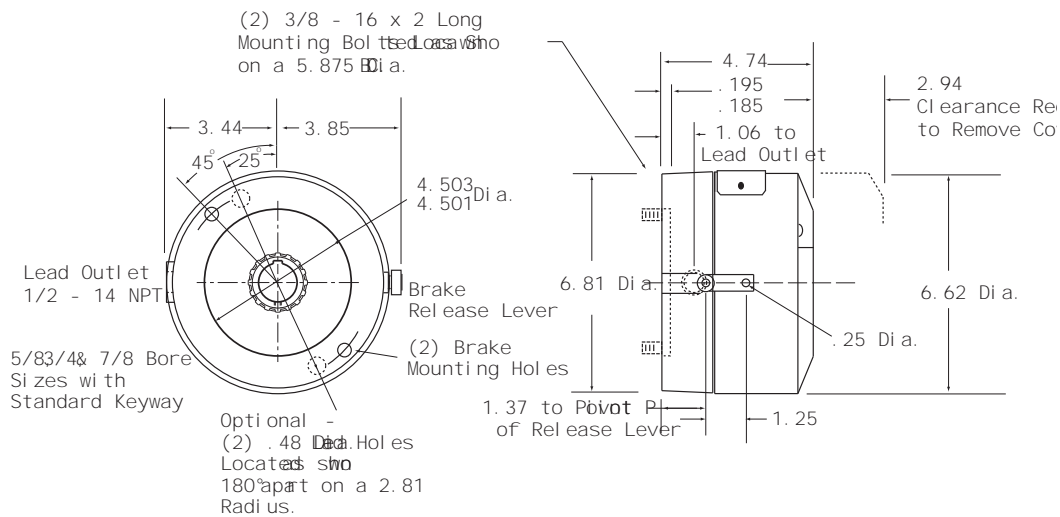
C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Cast Iron Head-Steel Cover

56,400 NEMA 2

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-056-411-00-BNF | F51A7325-W | 1-056-421-00-CNF | F51B7625-W | 1-056-431-00-DNF | F52C7725-W |
| 1-056-411-00-BOF | F51A7328-W | 1-056-421-00-COF | F51B7628-W | 1-056-431-00-DOF | F52C7728-W |
| 1-056-411-00-BPF | F51A7321-W | 1-056-421-00-CPF | F51B7621-W | 1-056-431-00-DPF | F52C7721-W |
| 1-056-411-00-BQF | F51A7324-W | 1-056-421-00-CQF | F51B7624-W | 1-056-431-00-DQF | F52C7724-W |
| 1-056-411-00-CNF | F51B7325-W | 1-056-421-00-DNF | F51C7625-W | 1-056-441-00-BNF | F53A7825-W |
| 1-056-411-00-COF | F51B7328-W | 1-056-421-00-DOF | F51C7628-W | 1-056-441-00-BOF | F53A7828-W |
| 1-056-411-00-CPF | F51B7321-W | 1-056-421-00-DPF | F51C7621-W | 1-056-441-00-BPF | F53A7821-W |
| 1-056-411-00-CQF | F51B7324-W | 1-056-421-00-DQF | F51C7624-W | 1-056-441-00-BQF | F53A7824-W |
| 1-056-411-00-DNF | F51C7325-W | 1-056-431-00-BNF | F52A7725-W | 1-056-441-00-CNF | F53B7825-W |
| 1-056-411-00-DOF | F51C7328-W | 1-056-431-00-BOF | F52A7728-W | 1-056-441-00-COF | F53B7828-W |
| 1-056-411-00-DPF | F51C7321-W | 1-056-431-00-BPF | F52A7721-W | 1-056-441-00-CPF | F53B7821-W |
| 1-056-411-00-DQF | F51C7324-W | 1-056-431-00-BQF | F52A7724-W | 1-056-441-00-CQF | F53B7824-W |
| 1-056-421-00-BNF | F51A7625-W | 1-056-431-00-CNF | F52B7725-W | 1-056-441-00-DNF | F53C7825-W |
| 1-056-421-00-BOF | F51A7628-W | 1-056-431-00-COF | F52B7728-W | 1-056-441-00-DOF | F53C7828-W |
| 1-056-421-00-BPF | F51A7621-W | 1-056-431-00-CPF | F52B7721-W | 1-056-441-00-DPF | F53C7821-W |
| 1-056-421-00-BQF | F51A7624-W | 1-056-431-00-CQF | F52B7724-W | 1-056-441-00-DQF | F53C7824-W |

F Series UNIBRAKES

C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Cast Iron Head and Cover

56,200 NEMA 2

Warner Electric Single C-Face Power-Off Brake is also available with cast iron housing for applications involving corrosive environments. Brakes are available from 3 ft. lb. to 15 ft. lb.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- Single-phase AC coils to provide fast release times and easy wiring
- Single C-Face



Brake Part Numbers

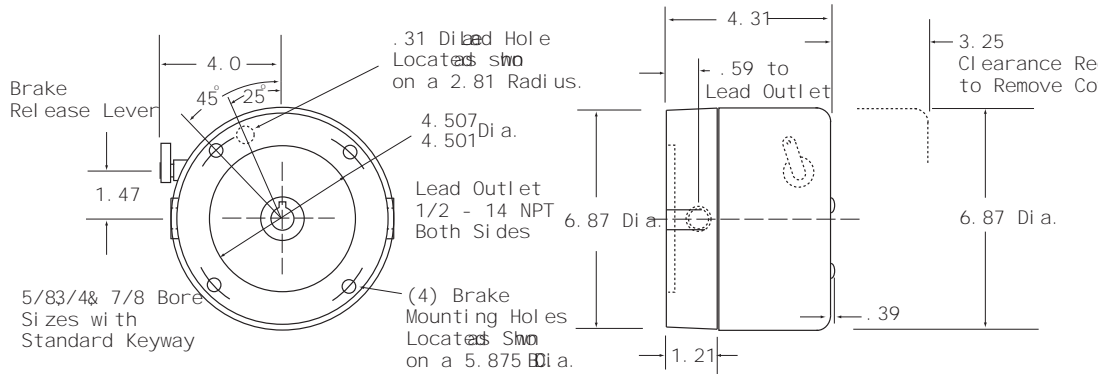
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (1 Disc) | 10 ft. lb. Brakes (2 Discs) | 15 ft. lb. Brakes (3 Discs) | Current Holding Amps | Current Inrush Amps |
|---------------------|---------------------------------|---------------------------------|-----------------------------------|-----------------------------------|-------------------------|------------------------|
| 5/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51A8311-W | F51A8611-W | F52A8711-W | F53A8811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51A8314-W | F51A8614-W | F52A8714-W | F53A8814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51A8315-W | F51A8615-W | F52A8715-W | F53A8815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51A8318-W | F51A8618-W | F52A8718-W | F53A8818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51A8319-W | F51A8619-W | F52A8719-W | F53A8819-W | .24/.12 | 1.76/.88 |
| 3/4 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51B8311-W | F51B8611-W | F52B8711-W | F53B8811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51B8314-W | F51B8614-W | F52B8714-W | F53B8814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51B8315-W | F51B8615-W | F52B8715-W | F53B8815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51B8318-W | F51B8618-W | F52B8718-W | F53B8818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51B8319-W | F51B8619-W | F52B8719-W | F53B8819-W | .24/.12 | 1.76/.88 |
| 7/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51C8311-W | F51C8611-W | F52C8711-W | F53C8811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51C8314-W | F51C8614-W | F52C8714-W | F53C8814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51C8315-W | F51C8615-W | F52C8715-W | F53C8815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51C8318-W | F51C8618-W | F52C8718-W | F53C8818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51C8319-W | F51C8619-W | F52C8719-W | F53C8819-W | .24/.12 | 1.76/.88 |

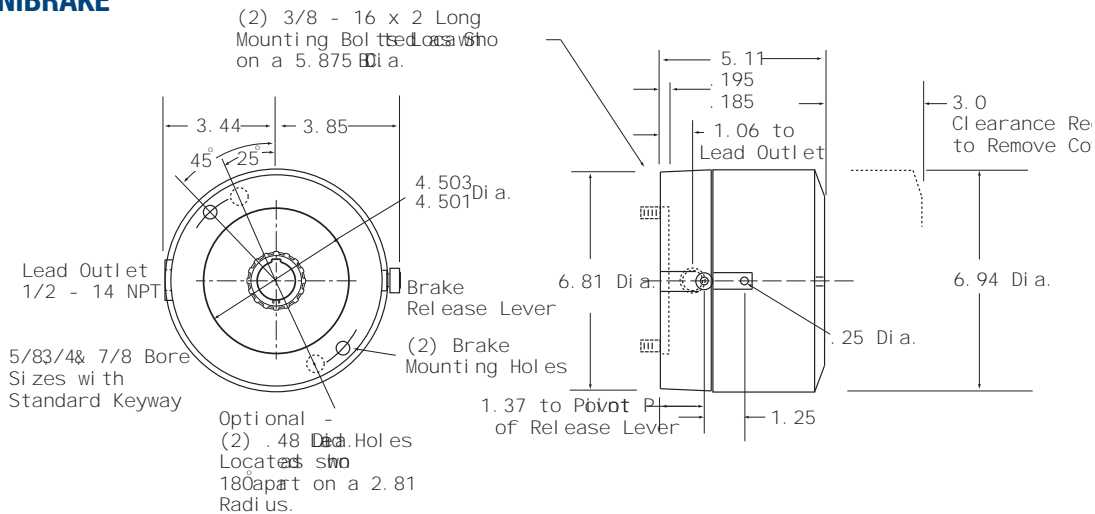
C-Face AC Rear-Mounted Brakes with NEMA 2 Housing Cast Iron Head and Cover

56,200 NEMA 2

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-056-211-00-BNF | F51A8315-W | 1-056-221-00-CNF | F51B8615-W | 1-056-231-00-DNF | F52C8715-W |
| 1-056-211-00-BOF | F51A8318-W | 1-056-221-00-COF | F51B8618-W | 1-056-231-00-DOF | F52C8718-W |
| 1-056-211-00-BPF | F51A8311-W | 1-056-221-00-CPF | F51B8611-W | 1-056-231-00-DPF | F52C8711-W |
| 1-056-211-00-BQF | F51A8314-W | 1-056-221-00-CQF | F51B8614-W | 1-056-231-00-DQF | F52C8714-W |
| 1-056-211-00-CNF | F51B8315-W | 1-056-221-00-DNF | F51C8615-W | 1-056-241-00-BNF | F53A8815-W |
| 1-056-211-00-COF | F51B8318-W | 1-056-221-00-DOF | F51C8618-W | 1-056-241-00-BOF | F53A8818-W |
| 1-056-211-00-CPF | F51B8311-W | 1-056-221-00-DPF | F51C8611-W | 1-056-241-00-BPF | F53A8811-W |
| 1-056-211-00-CQF | F51B8314-W | 1-056-221-00-DQF | F51C8614-W | 1-056-241-00-BQF | F53A8814-W |
| 1-056-211-00-DNF | F51C8315-W | 1-056-231-00-BNF | F52A8715-W | 1-056-241-00-CNF | F53B8815-W |
| 1-056-211-00-DOF | F51C8318-W | 1-056-231-00-BOF | F52A8718-W | 1-056-241-00-COF | F53B8818-W |
| 1-056-211-00-DPF | F51C8311-W | 1-056-231-00-BPF | F52A8711-W | 1-056-241-00-CPF | F53B8811-W |
| 1-056-211-00-DQF | F51C8314-W | 1-056-231-00-BQF | F52A8714-W | 1-056-241-00-CQF | F53B8814-W |
| 1-056-221-00-BNF | F51A8615-W | 1-056-231-00-CNF | F52B8715-W | 1-056-241-00-DNF | F53C8815-W |
| 1-056-221-00-BOF | F51A8618-W | 1-056-231-00-COF | F52B8718-W | 1-056-241-00-DOF | F53C8818-W |
| 1-056-221-00-BPF | F51A8611-W | 1-056-231-00-CPF | F52B8711-W | 1-056-241-00-DPF | F53C8811-W |
| 1-056-221-00-BQF | F51A8614-W | 1-056-231-00-CQF | F52B8714-W | 1-056-241-00-DQF | F53C8814-W |

F Series UNIBRAKES

C-Face AC Rear-Mounted Brakes with NEMA 4 Housing Cast Iron Head and Cover

56,200 NEMA 4

Warner Electric Single C-Face Power-Off Brake is also available with cast iron housing for applications involving corrosive environments. The heavy-duty housing also includes o-ring seals to create a dust-tight brake. Brakes are available from 3 ft. lb. to 15 ft. lb.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- Single-phase AC coils to provide fast release times and easy wiring
- Single C-Face



Brake Part Numbers

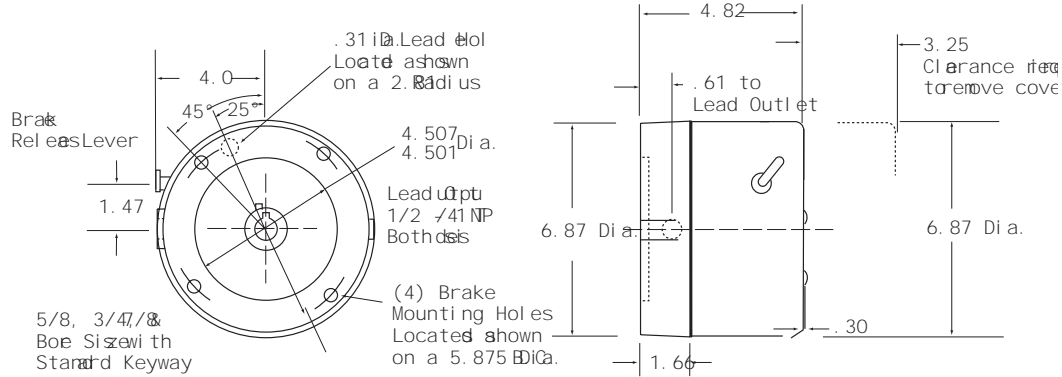
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (1 Disc) | 10 ft. lb. Brakes (2 Discs) | 15 ft. lb. Brakes (3 Discs) | Current Holding Amps | Current Inrush Amps |
|---------------------|---------------------------|---------------------------|-----------------------------|-----------------------------|----------------------|---------------------|
| 5/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51A1311-W | F51A1611-W | F52A1711-W | F53A1811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51A1314-W | F51A1614-W | F52A1714-W | F53A1814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51A1315-W | F51A1615-W | F52A1715-W | F53A1815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51A1318-W | F51A1618-W | F52A1718-W | F53A1818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51A1319-W | F51A1619-W | F52A1719-W | F53A1819-W | .24/.12 | 1.76/.88 |
| 3/4 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51B1311-W | F51B1611-W | F52B1711-W | F53B1811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51B1314-W | F51B1614-W | F52B1714-W | F53B1814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51B1315-W | F51B1615-W | F52B1715-W | F53B1815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51B1318-W | F51B1618-W | F52B1718-W | F53B1818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51B1319-W | F51B1619-W | F52B1719-W | F53B1819-W | .24/.12 | 1.76/.88 |
| 7/8 Bore Hub | | | | | | |
| 115/230, 60 HZ | F51C1311-W | F51C1611-W | F52C1711-W | F53C1811-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | F51C1314-W | F51C1614-W | F52C1714-W | F53C1814-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | F51C1315-W | F51C1615-W | F52C1715-W | F53C1815-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | F51C1318-W | F51C1618-W | F52C1718-W | F53C1818-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | F51C1319-W | F51C1619-W | F52C1719-W | F53C1819-W | .24/.12 | 1.76/.88 |

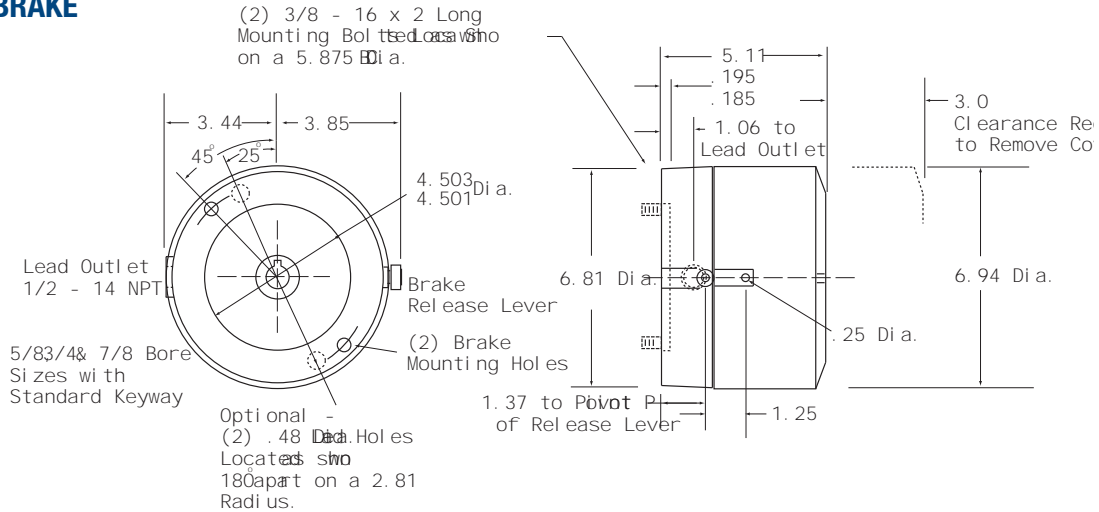
C-Face AC Rear-Mounted Brakes with NEMA 4 Housing Cast Iron Head and Cover

56,200 NEMA 4

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-056-212-00-BNF | F51A1315-W | 1-056-222-00-CNF | F51B1615-W | 1-056-232-00-DNF | F52C1715-W |
| 1-056-212-00-BOF | F51A1318-W | 1-056-222-00-COF | F51B1618-W | 1-056-232-00-DOF | F52C1718-W |
| 1-056-212-00-BPF | F51A1311-W | 1-056-222-00-CPF | F51B1611-W | 1-056-232-00-DPF | F52C1711-W |
| 1-056-212-00-BQF | F51A1314-W | 1-056-222-00-CQF | F51B1614-W | 1-056-232-00-DQF | F52C1714-W |
| 1-056-212-00-CNF | F51B1315-W | 1-056-222-00-DNF | F51C1615-W | 1-056-242-00-BNF | F53A1815-W |
| 1-056-212-00-COF | F51B1318-W | 1-056-222-00-DOF | F51C1618-W | 1-056-242-00-BOF | F53A1818-W |
| 1-056-212-00-CPF | F51B1311-W | 1-056-222-00-DPF | F51C1611-W | 1-056-242-00-BPF | F53A1811-W |
| 1-056-212-00-CQF | F51B1314-W | 1-056-222-00-DQF | F51C1614-W | 1-056-242-00-BQF | F53A1814-W |
| 1-056-212-00-DNF | F51C1315-W | 1-056-232-00-BNF | F52A1715-W | 1-056-242-00-CNF | F53B1815-W |
| 1-056-212-00-DOF | F51C1318-W | 1-056-232-00-BOF | F52A1718-W | 1-056-242-00-COF | F53B1818-W |
| 1-056-212-00-DPF | F51C1311-W | 1-056-232-00-BPF | F52A1711-W | 1-056-242-00-CPF | F53B1811-W |
| 1-056-212-00-DQF | F51C1314-W | 1-056-232-00-BQF | F52A1714-W | 1-056-242-00-CQF | F53B1814-W |
| 1-056-222-00-BNF | F51A1615-W | 1-056-232-00-CNF | F52B1715-W | 1-056-242-00-DNF | F53C1815-W |
| 1-056-222-00-BOF | F51A1618-W | 1-056-232-00-COF | F52B1718-W | 1-056-242-00-DOF | F53C1818-W |
| 1-056-222-00-BPF | F51A1611-W | 1-056-232-00-CPF | F52B1711-W | 1-056-242-00-DPF | F53C1811-W |
| 1-056-222-00-BQF | F51A1614-W | 1-056-232-00-CQF | F52B1714-W | 1-056-242-00-DQF | F53C1814-W |

M Series UNIBRAKES

Double C-Face AC Coupler Brakes with NEMA 2 Housing Aluminum Head and Cover

56,700 NEMA 2

The Double C-Face brake is designed for use as a coupler between standard C-Face motors and C-Face gear reducers.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- Single-phase AC coils to provide fast release times and easy wiring



Brake Part Numbers

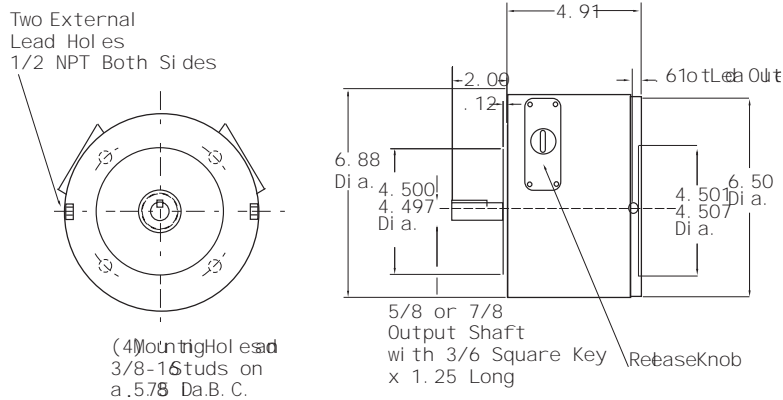
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (1 Disc) | 10 ft. lb. Brakes (2 Discs) | Current Holding Amps | Current Inrush Amps |
|---------------------------------------|---------------------------------|---------------------------------|-----------------------------------|-------------------------|------------------------|
| 5/8 Bore Shaft and Hub (56C) | | | | | |
| 115/230, 60 HZ | M51A0321-W | M51A0621-W | M52A0721-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | M51A0324-W | M51A0624-W | M52A0724-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | M51A0325-W | M51A0625-W | M52A0725-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | M51A0328-W | M51A0628-W | M52A0728-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | M51A0329-W | M51A0629-W | M52A0729-W | .24/.12 | 1.76/.88 |
| 7/8 Bore Shaft and Hub (145TC) | | | | | |
| 115/230, 60 HZ | M51C0321-W | M51C0621-W | M52C0721-W | .50/.25 | 3.66/1.83 |
| 230/460, 60 HZ | M51C0324-W | M51C0624-W | M52C0724-W | .28/.14 | 1.94/.97 |
| 287/575, 60 HZ | M51C0325-W | M51C0625-W | M52C0725-W | .22/.11 | 1.54/.77 |
| 115/230, 50 HZ | M51C0328-W | M51C0628-W | M52C0728-W | .45/.22 | 3.27/1.64 |
| 230/460, 50 HZ | M51C0329-W | M51C0629-W | M52C0729-W | .24/.12 | 1.76/.88 |

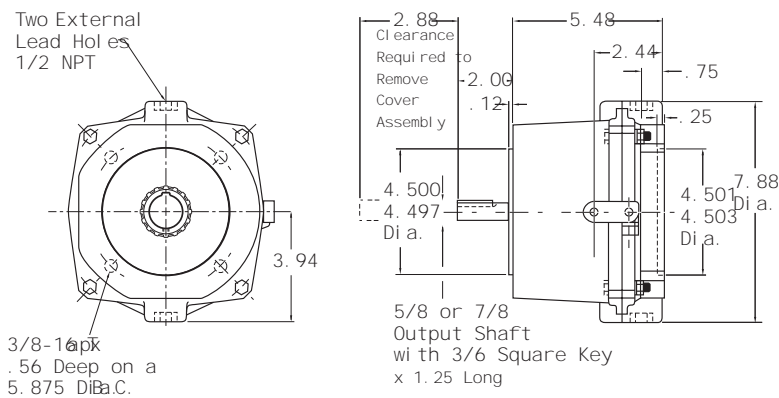
Double C-Face AC Coupler Brakes with NEMA 2 Housing Aluminum Head and Cover

56,700 NEMA 2

Stearns®



Warner UNIBRAKE



UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement | Stearns® Part Number | Warner Electric Replacement |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-056-711-05-NF | M51A0325-W | 1-056-721-05-NF | M51A0625-W | 1-056-731-05-NF | M52A0725-W |
| 1-056-711-05-OF | M51A0328-W | 1-056-721-05-OF | M51A0628-W | 1-056-731-05-OF | M52A0728-W |
| 1-056-711-05-PF | M51A0321-W | 1-056-721-05-PF | M51A0621-W | 1-056-731-05-PF | M52A0721-W |
| 1-056-711-05-QF | M51A0324-W | 1-056-721-05-QF | M51A0624-W | 1-056-731-05-QF | M52A0724-W |
| 1-056-711-07-NF | M51C0325-W | 1-056-721-07-NF | M51C0625-W | 1-056-731-07-NF | M52C0725-W |
| 1-056-711-07-OF | M51C0328-W | 1-056-721-07-OF | M51C0628-W | 1-056-731-07-OF | M52C0728-W |
| 1-056-711-07-PF | M51C0321-W | 1-056-721-07-PF | M51C0621-W | 1-056-731-07-PF | M52C0721-W |
| 1-056-711-07-QF | M51C0324-W | 1-056-721-07-QF | M51C0624-W | 1-056-731-07-QF | M52C0724-W |

M Series UNIBRAKES

Double C-Face DC Coupler Brakes with NEMA 2 Housing Aluminum Head and Cover

56,700 NEMA 2

The Double C-Face Brake is designed for use as a coupler between standard C-Face motors and C-Face gear reducers.

Features:

- External manual release lever
- Totally enclosed construction
- Torque adjustable from full-rated torque down to 50%
- DC coils to provide fast release times and easy wiring



Brake Part Numbers

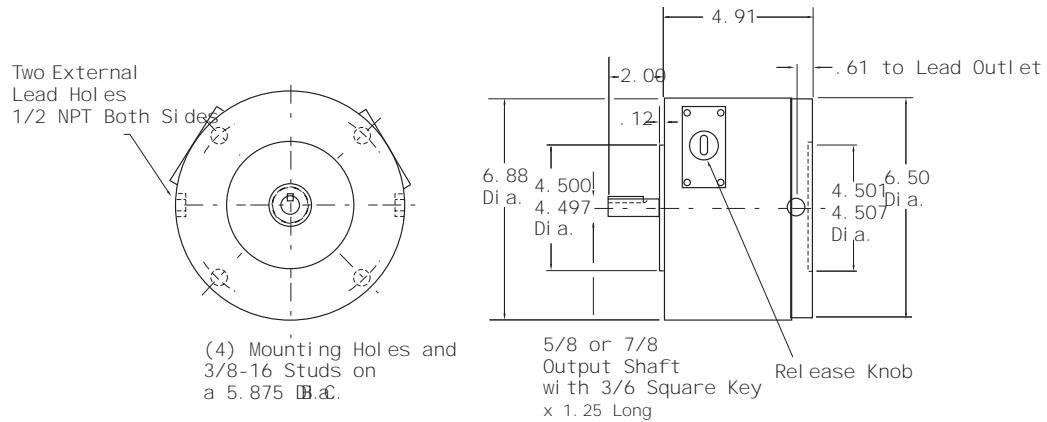
Technical Data

| Coil Voltage | 3 ft. lb. Brakes (1 Disc) | 6 ft. lb. Brakes (2 Discs) | 10 ft. lb. Brakes (3 Discs) | Current Holding Amps | Resistance Ohms |
|---------------------------------------|---------------------------------|----------------------------------|-----------------------------------|-------------------------|--------------------|
| 5/8 Bore Shaft and Hub (56C) | | | | | |
| 24 VDC | M51A032Y-W | M52A062Y-W | M53A072Y-W | .91 | 26.4 |
| 90 VDC | M51A032X-W | M52A062X-W | M53A072X-W | .25 | 365 |
| 7/8 Bore Shaft and Hub (145TC) | | | | | |
| 24 VDC | M51C032Y-W | M52C062Y-W | M53C072Y-W | .91 | 26.4 |
| 90 VDC | M51C032X-W | M52C062X-W | M53C072X-W | .25 | 365 |

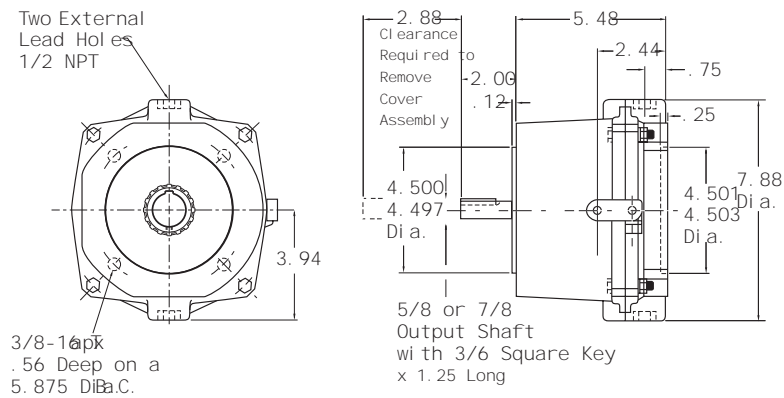
Double C-Face DC Coupler Brakes with NEMA 2 Housing Aluminum Head and Cover

56,700 NEMA 2

Stearns®



Warner UNIBRAKE

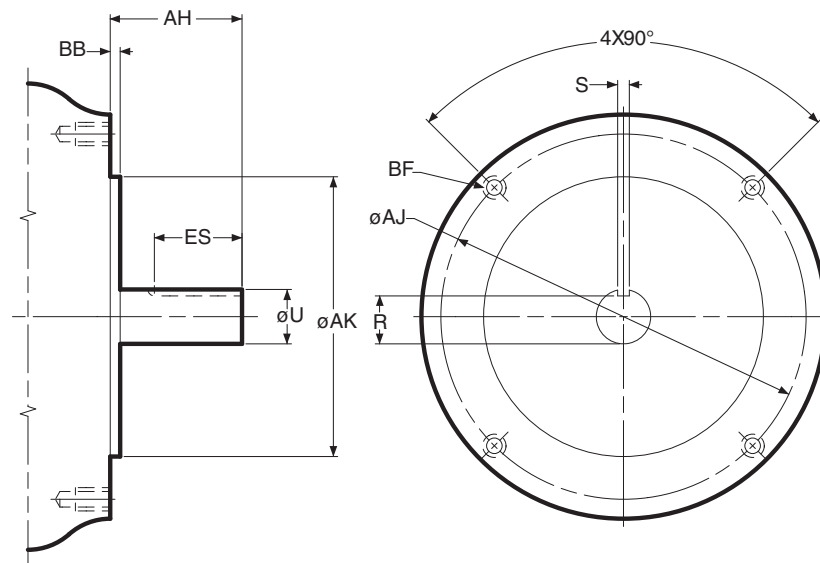


UNIBRAKE Interchange

| Stearns® Part Number | Warner Electric Replacement |
|-------------------------|--------------------------------|
| 1-056-711-05-UF | M51A032Y-W |
| 1-056-711-05-XF | M51A032X-W |
| 1-056-711-07-UF | M51C032Y-W |
| 1-056-711-07-XF | M51C032X-W |
| 1-056-721-05-UF | M52A062Y-W |
| 1-056-721-05-XF | M52A062X-W |
| 1-056-721-07-UF | M52C062Y-W |
| 1-056-721-07-XF | M52C062X-W |
| 1-056-731-05-UF | M53A072Y-W |
| 1-056-731-05-XF | M53A072X-W |
| 1-056-731-07-UF | M53C072Y-W |
| 1-056-731-07-XF | M53C072X-W |

| | |
|---|-----|
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Standard NEMA Frame Dimensions Ordering Information



Specifications

| Module Size | NEMA Frame Size | AH | AJ | AK | BB | BF | ES | R | S | U |
|-------------|-----------------|------|-------|-------|---------|------------|----------|-------|-------|-------|
| 50 | 56C/48Y | 2.06 | 5.875 | 4.500 | .16 MAX | 3/8-16 UNC | 1.41 MIN | 0.517 | 0.188 | 0.625 |
| 100 | 56C/48Y | 2.06 | 5.875 | 4.500 | .16 MAX | 3/8-16 UNC | 1.41 MIN | 0.517 | 0.188 | 0.625 |
| 180 | 182C/143TC | 2.12 | 5.875 | 4.500 | .16 MAX | 3/8-16 UNC | 1.41 MIN | 0.771 | 0.188 | 0.875 |
| | 184C/145TC | | | | | | | | | |
| 210 | 213C/182TC | 2.62 | 7.250 | 8.500 | .25 MIN | 1/2-13 UNC | 1.78 MIN | 0.986 | 0.250 | 1.125 |
| | 215C/184TC | | | | | | | | | |
| 215 | 213TC/215TC | 3.12 | 7.250 | 8.500 | .25 MIN | 1/2-13 UNC | 2.41 MIN | 1.201 | 0.312 | 1.375 |

Note: Warner Electric Modules are designed to comply with standard NEMA frame dimensions for mounting. Reference to each particular frame size is given in the individual selection tables for each type of Warner Electric module.

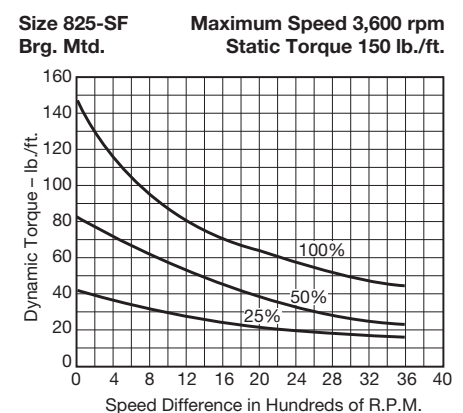
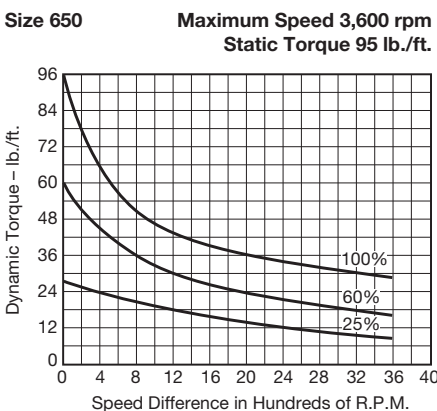
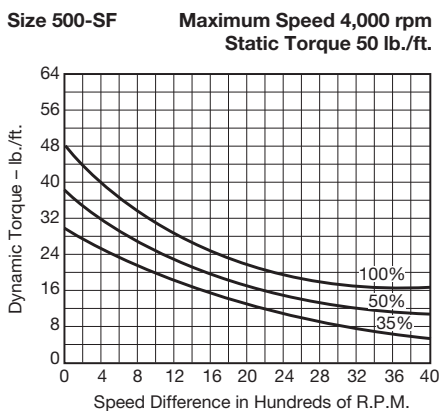
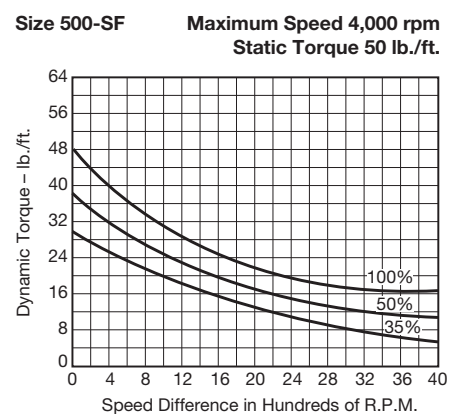
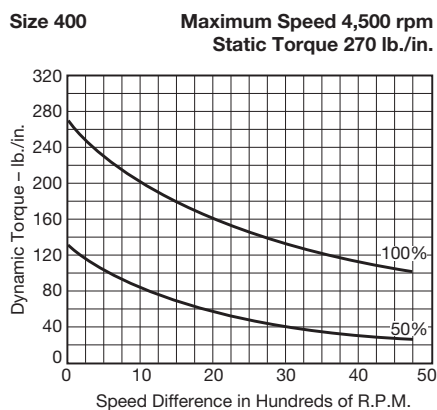
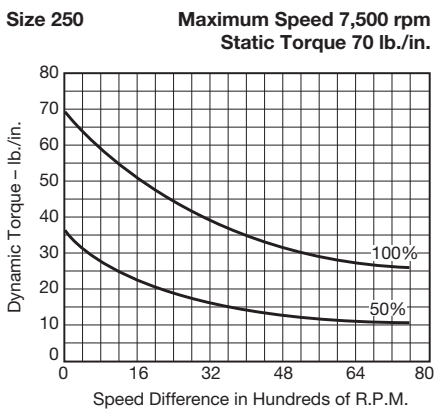
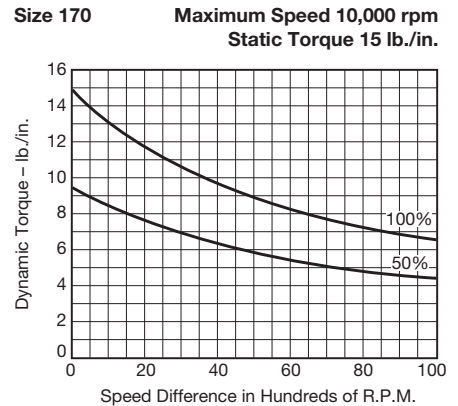
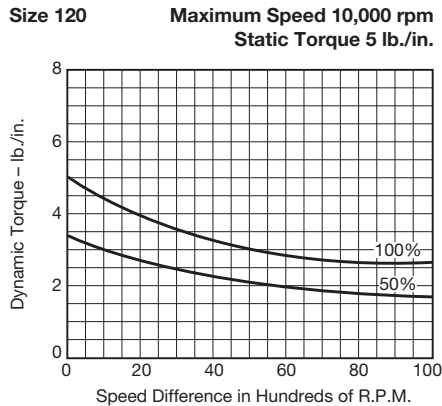
Mechanical Data Dynamic Torque

NOTES:

Speed difference means the difference in speed between one friction face and the other at the moment of engagement. The intersection of the top curve and the speed difference is the maximum torque produced by the unit. When both friction faces are engaged and rotating at the same speed, the unit is said to be locked-in and produces the maximum static torque (zero speed difference).

The % lines indicate the percentage of full voltage being used. Example: If 90 volt unit runs at 45 volts, use the 50% line.

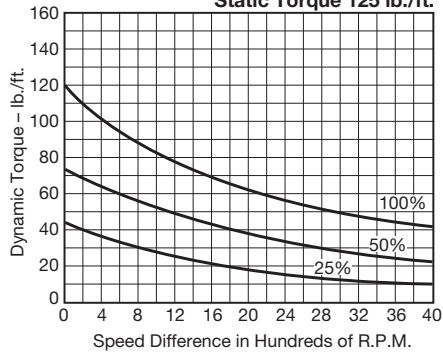
Average Torque = Dynamic Torque at $1/2$ operating speed. Example: If operating speed is 1800, use dynamic torque at 900.



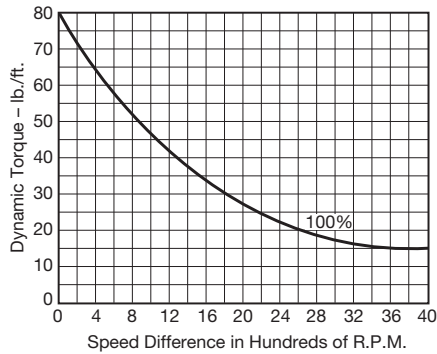
NOTE: Torque values are in inch lbs. for size 400 and smaller, and in ft.lbs. for size 500 and larger.

Mechanical Data Dynamic Torque

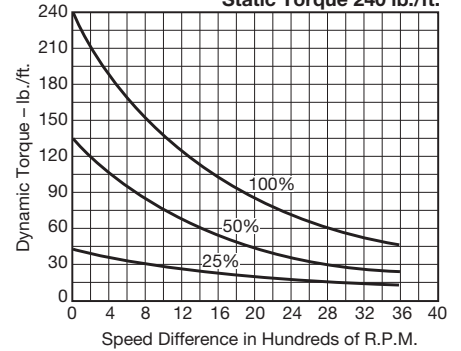
Size 825 Maximum Speed 4,000 rpm
Electro-Pack 3,600 rpm
Static Torque 125 lb./ft.



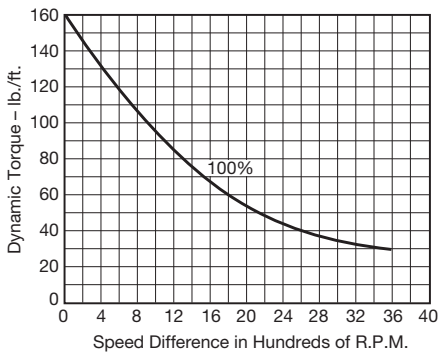
Size 825-MB Maximum Speed 4,000 rpm
Static Torque 80 lb./ft.



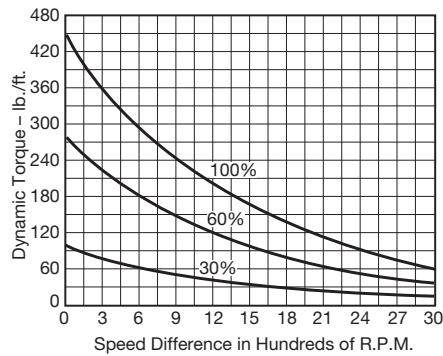
Size 1000 Maximum Speed 3,600 rpm
Electro-Pack 3,000 rpm
Static Torque 240 lb./ft.



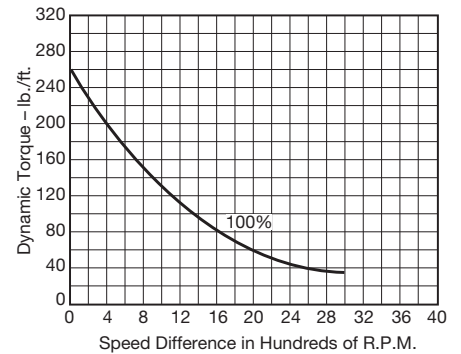
Size 1000-MB Maximum Speed 3,600 rpm
Static Torque 160 lb./ft.



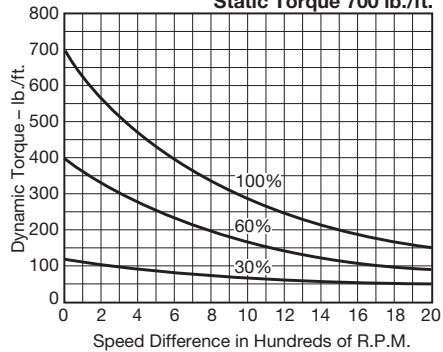
Size 1225 Maximum Speed 3,000 rpm
Static Torque 465 lb./ft.



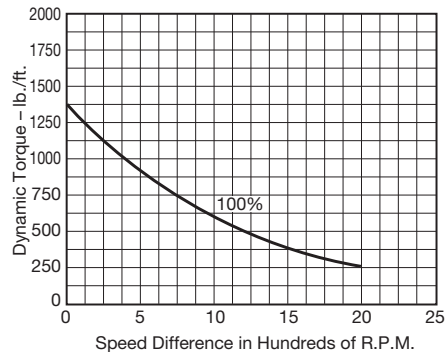
Size 1225-MB Maximum Speed 3,000 rpm
Static Torque 260 lb./ft.



Size 1525 Maximum Speed 2,000 rpm
Electro-Pack 1,800 rpm
Static Torque 700 lb./ft.



Size 1525-Hi Torque Maximum Speed 2,000 rpm
Static Torque 1,350 lb./ft.



Rotational Speed

Rotational speed of a clutch or brake is an important consideration when selecting a unit for a particular application. Numerous factors must be considered, such as the maximum rated speed of the clutch/brake unit, the dynamic torque required, the heat dissipation needed, the effect of speed on wear rate, and torque stability at very low speeds. Each of these issues are separate, and sometimes interrelated, but always important in selecting the right product for an application.

Maximum RPM Rating

The most important rotational speed consideration is the maximum rated RPM capability of a unit. DO NOT exceed this rating. Exceeding the maximum RPM of a unit may cause personal injury and/or machine damage. Maximum rated speeds are based on the structural integrity of the rotating components and associated shaft and bearing capabilities. If the RPM rating is exceeded, structural failure may occur, or the unit may experience premature bearing failure and/or premature friction material wear out.

Dynamic Torque

When determining the correct size clutch/brake for an application, dynamic torque at the highest slip speed is often the determining factor. As you can see by reviewing the dynamic torque curves for different units as shown starting on page 188, dynamic clutch/brake torque usually decreases with higher speeds. As slip RPM increases, the coefficient of friction of a unit decreases, causing a decrease in dynamic torque availability. Be careful to consider this when selecting the appropriate unit size needed.

Heat Dissipation

Heat dissipation is inversely related to dynamic torque. As RPM increases, the heat dissipation ability of a unit increases. When an armature is rotating, the heat dissipation rate is proportional to the aerodynamic fan effect of the rotating armature. The faster the armature rotates, the greater the heat dissipation. This is illustrated with a typical catalog curve as shown in Figure 1. It's interesting to note that, at zero RPM, the unit still has some heat dissipation capability. This is due to convection and radiation, but is usually not an important consideration.

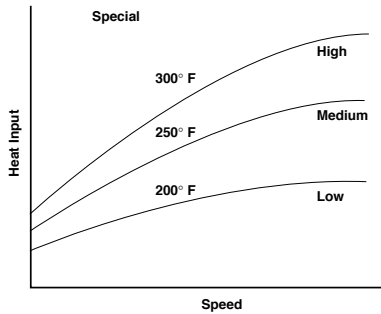


Figure 1: Typical Heat Dissipation Characteristics

Wear Rate

The wear rate of friction surfaces is dependent on the clamping pressure of the mating surfaces as well as the surface velocity between the wearing surfaces. Many variables are involved in predicting wear life, of which RPM is probably the most influential. Typically, the wear rate will increase directly with the rubbing velocity distance. Another way of stating this is the higher the relative engagement speeds of two rotating parts, the longer they are allowed to slip against each other and the faster the wear rate.

Low Speed Operation

The effect of low speed usage should also be considered in applications. Performance of clutch/brake units at less than 100 RPM may be very different than at higher RPM. This is due to "burnish" characteristics of friction surfaces.

Wear In

"Burnish" is the wear in, or mating of two surfaces. When new, these surfaces have manufacturing features which include roughness and waviness. When these surfaces come into initial contact, only the high spots actually meet. See Figure 2. This results in only a small surface area in contact, while the non-contact surface area is "air." The result is low torque. As the mating surfaces continue to engage and slip against each other, the high spots are worn down and more surface area is in contact, thus increasing torque capability. This wear in period, or burnish, typically occurs in the first few hundred cycles of a clutch/brake's life. Faster slip speeds and higher loads mean fewer cycles needed to complete the burnish process. For applications where the speed is less than

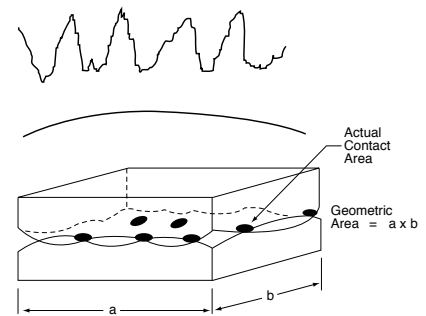


Figure 2: Unburnished Contact Areas

100 RPM, the required application torque should be doubled to compensate for the low speed "burnish" that the unit experiences. A low speed burnish will require many cycles before full torque and stability are achieved. For example, if an application is determined to need 20 ft.lbs. of static torque, an SF-400 clutch could be selected. But, if the application is only 100 RPM or less, then an SF-500 unit should be the choice to compensate for the low RPM usage, as indicated on the selection chart found on page 188.

Careful consideration of rotating speeds will help the selection process of an application. Follow these guidelines and the proper clutch/brake selected will provide troublefree operation.

Mechanical Data Clutch Field Restraining Devices

Many Warner Electric clutch assemblies have a bearing mounted stationery field. By design the bearing maintains its proper position between the field and rotor making it easy for the customer to mount the field-rotor assembly. However, the bearing has a slight drag which tends to make the field rotate if not restrained. And, since the field has lead wires attached, it must be restrained to prevent rotation and pulling of these wires. To counteract this rotational force, the field has a "torque tab" to which the customer must attach an appropriate anti-rotational restraint.

A few hints regarding proper torque tab restraints are in order. First and foremost, it is important to recognize that the force to be overcome is very small and the tab should not be restrained in any manner which will preload the bearing. For example, if the clutch is mounted with the back of the field adjacent to a rigid machine member the customer should not attach a capscrew tightly between the tab and the machine member. This may pull the tab back against the rigid member as shown in Figure 1 and preload the bearing. The recommended methods are illustrated in Figures 2, 3, and 4. The method selected is primarily a matter of customer preference or convenience.

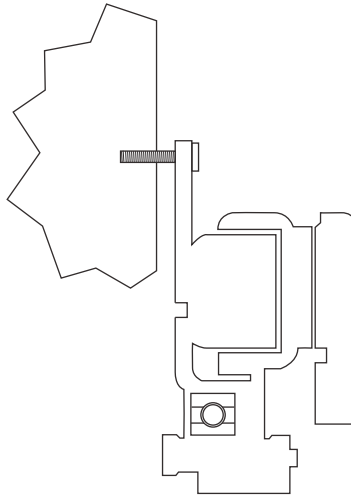


Figure 1:
Rigid member

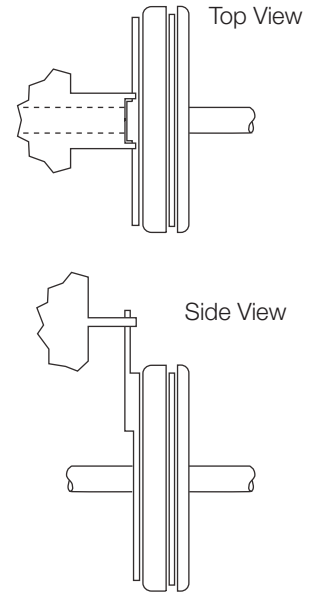


Figure 2:
Rigid Member with Slot
Straddling Tab
(Preferred)

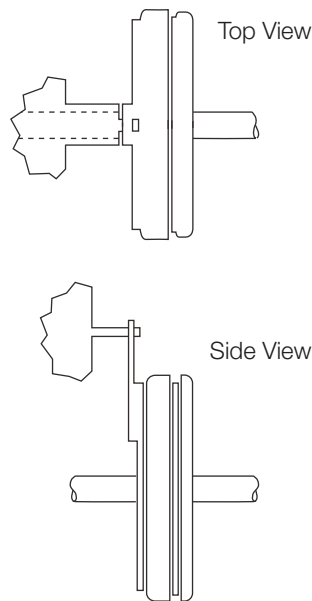


Figure 3:
Pin in Hole
Loosely
(Preferred)

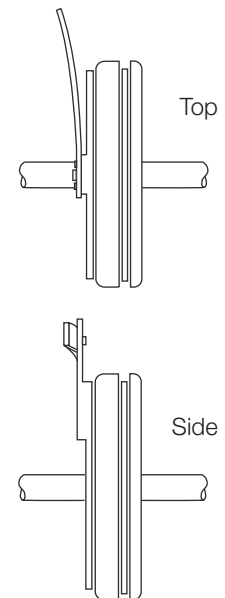


Figure 4:
Flexible Strap
(Preferred)

Electrical Data Coil Ratings

| EC/EB-375 | EC | | | EB | | |
|------------------------------|-------|------|------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 453.5 | 29.3 | 2.10 | 446.8 | 29.3 | 1.96 |
| Current – Amperes | .198 | .82 | 2.85 | .201 | .82 | 3.07 |
| Watts | 17 | 20 | 17 | 18 | 20 | 18 |
| Coil Build-up – milliseconds | 62 | 60 | 59 | 50 | 60 | 52 |
| Coil Decay – milliseconds | 13 | 14 | 15 | 8 | 14 | 10 |

| EC/EB-475 | EC | | | EB | | |
|------------------------------|-------|------|------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 368.9 | 37.8 | 2.32 | 443.1 | 28.8 | 2.05 |
| Current – Amperes | .244 | .64 | 2.58 | .203 | .88 | 2.93 |
| Watts | 22 | 15 | 16 | 18 | 21 | 18 |
| Coil Build-up – milliseconds | 92 | 91 | 90 | 80 | 75 | 70 |
| Coil Decay – milliseconds | 18 | 17 | 16 | 8 | 9 | 9 |

| EC/EB-650 | EC | | | EB | | |
|------------------------------|-----|------|------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 225 | 17.7 | 1.16 | 257.2 | 18.3 | 1.24 |
| Current – Amperes | .4 | 1.36 | 5.19 | .35 | 1.3 | 4.84 |
| Watts | 36 | 33 | 31 | 32 | 31 | 29 |
| Coil Build-up – milliseconds | 120 | 115 | 110 | 112 | 108 | 105 |
| Coil Decay – milliseconds | 20 | 20 | 20 | 12 | 13 | 14 |

| FB/ER-375, 475, 650 | FB-375 | | FB-475FB-650 | | | |
|------------------------------|--------|------|--------------|------|------|-------|
| Resistance @ 20° C – Ohms | 446 | 29 | 310 | 22 | 235 | 16 |
| Current – Amperes | .201 | .822 | .300 | 1.09 | .380 | 1.426 |
| Watts | 18 | 19 | 27 | 26 | 34 | 34 |
| Coil Build-up – milliseconds | 40 | 40 | 80 | 80 | 90 | 90 |
| Coil Decay – milliseconds | 5 | 10 | 8 | 10 | 10 | 10 |

| ER-825, 1225 | ER-825 | | ER-1225 | | | |
|------------------------------|--------|--|---------|--|--|--|
| Voltage – DC | 90 | | 35-75 | | | |
| Resistance @ 20° C – Ohms | 304 | | 235 | | | |
| Current – Amperes | .29 | | .383 | | | |
| Watts | 26 | | 35 | | | |
| Coil Build-up – milliseconds | 400 | | 700 | | | |
| Coil Decay – milliseconds | 20 | | 20 | | | |

| EC/EB-825 | EC | | | EB | | |
|------------------------------|------|------|-------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 221 | 20.9 | 1.098 | 223.3 | 20.4 | 1.27 |
| Current – Amperes | .407 | 1.15 | 5.464 | .4 | 1.18 | 4.74 |
| Watts | 37 | 28 | 33 | 36 | 28 | 28 |
| Coil Build-up – milliseconds | 225 | 200 | 180 | 170 | 170 | 170 |
| Coil Decay – milliseconds | 130 | 122 | 115 | 80 | 75 | 70 |

| EC/EB-1000 | EC | | | EB | | |
|------------------------------|-------|------|------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 248.7 | 19.7 | 1.23 | 248.7 | 19.7 | 1.23 |
| Current – Amperes | .36 | 1.22 | 4.87 | .36 | 1.22 | 4.87 |
| Watts | 33 | 29 | 29 | 33 | 29 | 29 |
| Coil Build-up – milliseconds | 250 | 235 | 220 | 235 | 220 | 205 |
| Coil Decay – milliseconds | 70 | 75 | 80 | 70 | 75 | 80 |

| EC/EB-1225 | EC | | | EB | | |
|------------------------------|-------|------|------|-------|------|------|
| Voltage – DC | 90 | 24 | 6 | 90 | 24 | 6 |
| Resistance @ 20° C – Ohms | 207.3 | 15.1 | 1.04 | 261.7 | 22.3 | 1.33 |
| Current – Amperes | .43 | 1.59 | 5.79 | .34 | 1.08 | 4.5 |
| Watts | 39 | 38 | 35 | 31 | 26 | 27 |
| Coil Build-up – milliseconds | 500 | 490 | 480 | 460 | 445 | 435 |
| Coil Decay – milliseconds | 220 | 230 | 240 | 190 | 160 | 140 |

| ATC, ATTC, ATB, ATTB-25 | ATC | | | ATB | | |
|------------------------------|------|------|------|------|------|------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20° C – Ohms | 1.37 | 20.2 | 290 | 1.37 | 20.2 | 290 |
| Current – Amperes | 4.38 | 1.19 | .31 | 4.38 | 1.19 | .31 |
| Watts | 26.3 | 28.6 | 27.9 | 26.3 | 28.6 | 27.9 |
| Coil Build-up – milliseconds | 145 | 145 | 145 | 145 | 145 | 145 |
| Coil Decay – milliseconds | 8 | 8 | 8 | 9 | 9 | 9 |

| ATC, ATTC, ATB, ATTB-55 | ATC | | | ATB | | |
|------------------------------|------|------|------|------|------|------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20° C – Ohms | 1.21 | 19.6 | 230 | 1.21 | 19.6 | 230 |
| Current – Amperes | 4.96 | 1.22 | .39 | 4.96 | 1.22 | .39 |
| Watts | 29.8 | 29.3 | 35.2 | 29.8 | 29.3 | 35.2 |
| Coil Build-up – milliseconds | 200 | 200 | 200 | 210 | 210 | 210 |
| Coil Decay – milliseconds | 20 | 20 | 20 | 35 | 35 | 35 |

| ATC, ATTC, ATB, ATTB-115 | ATC | | | ATB | | |
|------------------------------|------|------|------|------|------|------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20° C – Ohms | 1.02 | 16.5 | 182 | 1.02 | 16.5 | 182 |
| Current – Amperes | 5.91 | 1.46 | .50 | 5.91 | 1.46 | .50 |
| Watts | 35.4 | 35 | 44.6 | 35.4 | 35 | 44.6 |
| Coil Build-up – milliseconds | 145 | 145 | 145 | 150 | 150 | 150 |
| Coil Decay – milliseconds | 40 | 40 | 40 | 45 | 45 | 45 |

Electrical Data Coil Ratings

(Blue shaded areas indicate GEN 2 design)

| UM/EM/UMFB/EMFB | | Clutch | UM/EM Brake | Clutch | UM/EM Brake | Clutch | UM/EM Brake | UMFB/EMFB Brake | UMFB/EMFB Brake |
|---------------------------|------------|--------|----------------|--------|----------------|--------|----------------|--------------------|--------------------|
| Voltage – DC | | 90 | 90 | 24 | 24 | 6 | 6 | 24 | 90 |
| Resistance (ohms) | EM-50 | 452 | 429 | 31.8 | 28.8 | 1.9 | 1.9 | 28.8 | 429 |
| | EM-100 | 392 | 392 | 26.7 | 26.7 | 1.8 | 1.8 | 21.7 | 308 |
| | EM-180 | 392 | 392 | 26.7 | 26.7 | 1.8 | 1.8 | 21.7 | 308 |
| | EM-210/215 | 248 | 248 | 17.9 | 17.9 | 1.22 | 1.22 | 13.3 | 205 |
| Amperes | EM-50 | .20 | .21 | .76 | .83 | 3.2 | 3.2 | .83 | .21 |
| | EM-100 | .23 | .23 | .90 | .90 | 3.3 | 3.3 | 1.1 | .29 |
| | EM-180 | .23 | .23 | .90 | .90 | 3.3 | 3.3 | 1.1 | .29 |
| | EM-210/215 | .36 | .36 | 1.3 | 1.3 | 4.9 | 4.9 | 1.8 | .38 |
| Watts | EM-50 | 18 | 19 | 19 | 20 | 20 | 20 | 20 | 19 |
| | EM-100 | 21 | 21 | 22 | 22 | 20 | 20 | 27 | 27 |
| | EM-180 | 21 | 21 | 22 | 22 | 20 | 20 | 27 | 27 |
| | EM-210/215 | 33 | 33 | 32 | 32 | 30 | 30 | 43 | 34 |
| Build-up (millisecond) | EM-50 | 52 | 53 | 52 | 53 | 52 | 53 | 40 | 40 |
| | EM-100 | 72 | 75 | 72 | 75 | 72 | 70 | 80 | 80 |
| | EM-180 | 72 | 75 | 72 | 75 | 72 | 70 | 80 | 80 |
| | EM-210/215 | 120 | 100 | 120 | 100 | 110 | 100 | 90 | 90 |
| Decay (millisecond) | EM-50 | 6 | 5 | 6 | 5 | 6 | 5 | 5 | 5 |
| | EM-100 | 12 | 10 | 12 | 10 | 12 | 10 | 8 | 8 |
| | EM-180 | 12 | 10 | 12 | 10 | 12 | 10 | 8 | 8 |
| | EM-210/215 | 20 | 10 | 20 | 10 | 20 | 10 | 10 | 10 |

Electrical Data Coil Ratings

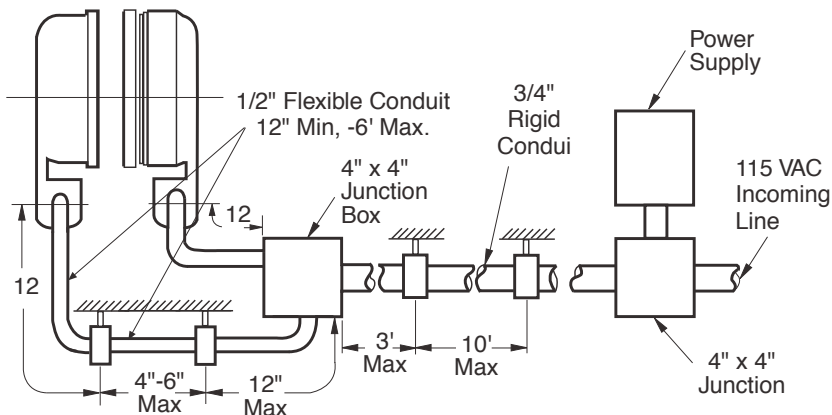
| Unit Size | SF/PB 120 | | | SF/PB 170 | | | SF/PB 250 | | |
|------------------------------|-----------|------|------|-----------|-------|------|-----------|------|------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20°C – Ohms | 6.32 | 104 | 1386 | 6.96 | 111.2 | 1506 | 5 | 76.4 | 1079 |
| Current – Amperes | .949 | .230 | .065 | .861 | .215 | .060 | 1.2 | .314 | .084 |
| Watts | 5.69 | 5.52 | 5.85 | 5.85 | 5.16 | 5.37 | 7.2 | 7.5 | 7.51 |
| Coil Build-up – milliseconds | 12 | 12 | 11 | 17 | 17 | 16 | 48 | 48 | 44 |
| Coil Decay – milliseconds | 8 | 8 | 7 | 8 | 7 | 6 | 15 | 15 | 13 |

| Unit Size | SF/PB 400 | | | SF-500 | | | PB & PC 500 | | | SF-650 | | |
|------------------------------|-----------|------|------|--------|------|-------|-------------|------|-------|--------|------|-----|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20°C – Ohms | 4.88 | 73 | 1087 | 1.076 | 14.9 | 206.1 | 1.36 | 23.8 | 251.1 | 1.16 | 17.7 | 225 |
| Current – Amperes | 1.23 | .322 | .083 | 5.58 | 1.61 | .44 | 4.4 | 1.01 | .36 | 5.19 | 1.36 | .4 |
| Watts | 7.39 | 7.96 | 7.45 | 34 | 39 | 39 | 26 | 24 | 32 | 31 | 33 | 36 |
| Coil Build-up – milliseconds | 154 | 154 | 154 | 82 | 85 | 90 | 84 | 87 | 93 | 110 | 115 | 120 |
| Coil Decay – milliseconds | 62 | 60 | 55 | 40 | 40 | 40 | 38 | 35 | 30 | 50 | 50 | 50 |

| Unit Size | PB-650 | | | SF-825 | | | SF-825 Brg | | | PB & PC 825 | | | SF-1000 | | | PB & PC 1000 | | |
|------------------------------|--------|------|-------|--------|------|-------|------------|------|------|-------------|------|-------|---------|------|-------|--------------|------|-------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 |
| Resistance @ 20°C – Ohms | 1.24 | 18.3 | 257.2 | 1.23 | 20.9 | 267.0 | 1.098 | 14.6 | 221 | 1.27 | 20.4 | 223.3 | 1.07 | 14.4 | 214.4 | 1.23 | 19.7 | 248.7 |
| Current – Amperes | 4.84 | 1.31 | .35 | 4.9 | 1.15 | .34 | 5.464 | 1.65 | .407 | 4.74 | 1.18 | .4 | 5.61 | 1.67 | .42 | 4.87 | 1.22 | .36 |
| Watts | 29 | 31 | 32 | 29 | 28 | 30 | 33 | 40 | 37 | 28 | 28 | 36 | 34 | 40 | 38 | 29 | 29 | 33 |
| Coil Build-up – milliseconds | 100 | 105 | 110 | 222 | 200 | 245 | 180 | 200 | 225 | 170 | 170 | 170 | 256 | 275 | 283 | 205 | 220 | 235 |
| Coil Decay – milliseconds | 50 | 50 | 50 | 105 | 120 | 100 | 115 | 120 | 130 | 70 | 75 | 80 | 123 | 105 | 90 | 70 | 75 | 80 |

| Unit Size | SF-1225 | | | PB & PC 1225 | | | SF-1525 | | | PB & PC 1525 | | | SF-1525 H.T. | |
|------------------------------|---------|------|-------|--------------|------|-------|---------|------|-------|--------------|------|-------|--------------|-------|
| Voltage – DC | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 24 | 90 | 6 | 90 |
| Resistance @ 20°C – Ohms | 1.21 | 19.5 | 268.3 | 1.33 | 22.3 | 261.7 | 1.11 | 15.5 | 239.1 | 1.45 | 19.8 | 258.4 | 55 | 113.4 |
| Current – Amperes | 4.97 | 1.23 | .34 | 4.5 | 1.08 | .34 | 5.41 | 1.55 | .38 | 4.13 | 1.21 | .35 | 10.83 | .794 |
| Watts | 30 | 30 | 30 | 27 | 26 | 31 | 32 | 37 | 34 | 25 | 29 | 31 | 65 | 72 |
| Coil Build-up – milliseconds | 475 | 490 | 510 | 300 | 320 | 350 | 505 | 535 | 575 | 470 | 490 | 512 | 480 | 560 |
| Coil Decay – milliseconds | 240 | 230 | 220 | 190 | 190 | 190 | 230 | 237 | 215 | 200 | 170 | 140 | 210 | 160 |

NOTES: Build-up time equals current to approximately 90% of steady state value and flux to 90%. Decay time equals current to approximately 10% of steady state value and flux to 10%. Approximately because current leads or lags flux by a small amount.



Recommended Electrical Installation Procedure for Warner Electric Clutches and Brakes

Warner Electric clutches and brakes conform to UL (Underwriters Laboratories) requirements. All packaged products come with conduit boxes or are enclosed in housings with provision for electrical conduit connection. All sizes 400 and larger SF clutch fields and brake magnets accept UL conforming conduit boxes available from Warner Electric.

The National Electrical Code (NEC) requires that conductors subject to physical damage be adequately protected. When electrical conduit is used, a minimum of 12" of 1/2" flexible conduit is to be used between each brake and/or clutch and its box. This construction will prevent improper bearing loading in bearing mounted units and ease field and magnet assembly and disassembly.

Refer to the information below for proper installation practices and wire sizes.

Notwithstanding the above recommendations, all electrical installations should conform to NEC and/or other governing electrical codes.

Recommended wire size versus maximum distance

| Wire Size AWG | Fractional Horsepower Sizes 170-400 | | | Integral Horsepower Sizes 500-1525 | | |
|------------------|--|---------|---------|---------------------------------------|---------|---------|
| | Distance (feet) | | | Distance (feet) | | |
| | 6 Volt | 24 Volt | 90 Volt | 6 Volt | 24 Volt | 90 Volt |
| 18 | 20 | 280 | 1000 | 4 | 65 | 700 |
| 16 | 30 | 430 | | 6 | 95 | |
| 14 | 50 | 720 | | 10 | 160 | |
| 12 | 75 | 720 | | 10 | 160 | |
| 10 | 125 | | | 25 | 400 | |
| 8 | 200 | | | 40 | | |

General construction wire type MTW or THW recommended.
 #6 terminal screws (size 400 and smaller) are to be torqued to 15 in.lb.
 #8 terminal screws (size 500 and larger) are to be torqued to 20 in.lb.

Electrical Data Coil Suppression & Clutch/Brake Overlap

Users of electric clutch and brake systems are sometimes concerned that a clutch and brake will oppose each other or “overlap” during switching, i.e., when the clutch is switched off and the brake is switched on, or vice versa. This concern relates primarily to dual armature type clutch/brakes similar to the Warner Electric Electro Module product line, as compared to shuttle armature clutch/brakes.

In use, Warner Electric clutches and brakes are not subject to overlap when simple coil suppression techniques are applied to the clutch/brake control. All Warner Electric clutch/brake controls use suppression to eliminate any overlap situations.

The charts below graphically display clutch current decay and the current rise of the brake with and without current suppression. In Chart 1, which shows brake and clutch operation with suppression, the “Overlap Area” below the intersection of the brake and clutch current lines shows potential for the

devices to fight one another. But this intersection occurs at an extremely low current level and the armature Autogap™ springs keep the friction surfaces of the brake armature and magnet separate at such low currents. Even though there is the appearance of a minor clutch/brake overlap in this instance, the brake armature has not yet contacted the brake magnet. Chart 2 shows a much larger overlap area since no coil suppression is used in this circuit. Clutch current has not decayed fully as the brake is engaged and the load is brought to zero speed.

Clutch and brake coils are inductors. Inductance is the electrical equivalent to mechanical inertia and an energized coil dissipates its energy when turned “off.” Upon removal of power, polarity across an inductor reverses and current flows in the opposite direction. Without suppression in the control circuit, an arc can result from the strength of this current flow which can damage the electrical switching contacts.

Consequently, suppression circuitry has two major benefits:

- Protects the switching contacts
- Hastens coil decay

The schematics below show circuits with no suppression and both diode and zener suppression types.

The rapid coil decay of suppression circuitry lets users enjoy the major advantages which dual armatures have over single, “shuttle” armatures. These include:

- Better heat dissipation – greater area to give off heat and more “off” time
- Longer life – two armatures absorb wear
- Self adjusting for the life of the unit
- Enhanced repeatability – armatures may remain in light contact with their mating surface, eliminating armature movement time and reducing noise and spline wear.

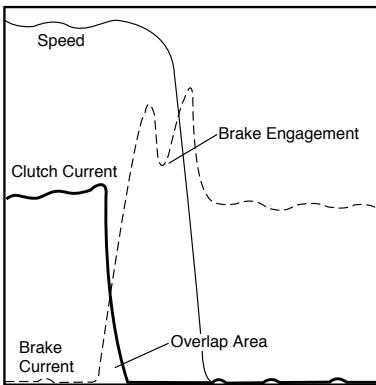


Chart 1

Brake Engagement with Zener Diode Suppression

Clutch current decay and brake current rise overlap, but the brake armature is not engaged until well past the overlap point. Note that the “blip” in the brake current trace coincides with the sharp decline in the “speed” trace, indicating brake armature engagement at that point.

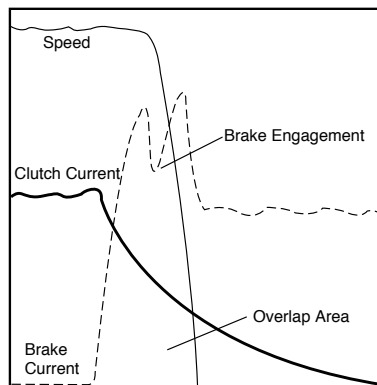
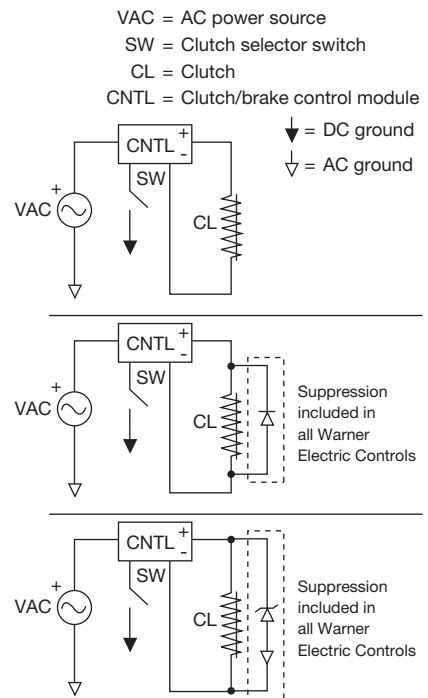


Chart 2

Brake Engagement with No Suppression

Clutch current decay is much slower than with suppression as shown in Chart 1, greatly increasing the overlap area. The current level in the clutch coil is much higher at the point of brake engagement than with the suppression circuit.



Overexcitation is a technique which makes a clutch or brake engage faster and have greatly improved starting and stopping accuracy. It involves applying over voltage to the clutch or brake coil to reduce current build up time, thereby reducing the magnetizing time.

The graphs below show current rise and shaft speed for an identical system using a Warner Electric EP-400 clutch/brake both with and without overexcitation. The effect of overexcitation is to reduce the time needed to achieve full current and thereby reduce the time required to achieve full speed with a clutch or zero speed with a brake. In the example below, "time to start" is approximately

70 ms without overexcitation. This is reduced to 30 ms when overexcitation is applied. This time is comparable to the coil buildup times stated on page 194. The "time to stop" has been similarly reduced; the nominally excited system requires about 110 ms to stop the load, while this is accomplished in only 50 ms with overexcitation.

Overexcitation does not increase torque. Rather, the reduction in start-stop times comes from reduced coil current build up times (or "time to current"). For many common industrial applications, the reduction in "time to speed" and "time to stop" is one half when using overexcitation.

The use of overexcitation on a clutch/brake system does not increase system wear. In fact, the clutch/brake wear rate may be reduced because slippage and energy dissipation is marginally reduced in the clutch/brake. Compliance in the drivetrain may absorb some of the start/stop inertia or wear may be observed in other drivetrain components. Whenever overexcitation is used, adequate coil suppression must be employed. Please refer to "Coil Suppression and Clutch/Brake Overlap" on page 196.

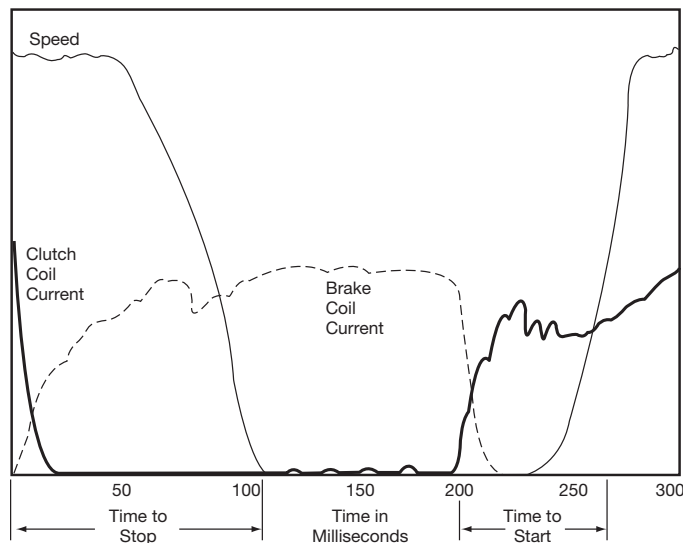


Chart 1

Without Overexcitation

Current/speed trace of EP400 clutch/brake being run through a single stop/start cycle. Note that 110 milliseconds is required to stop from the time the clutch coil is de-energized and the brake coil is energized. At the 200 milliseconds point on the graph the clutch coil is energized and the load is at speed 70 milliseconds later. Note that the coil current is still increasing after the load is at full speed.

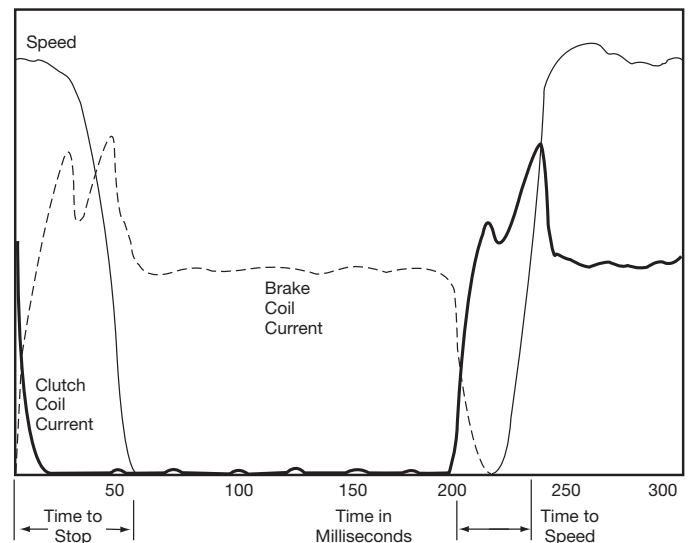


Chart 2

With Overexcitation

Current/speed trace of EP400 clutch/brake being run through a single stop/start cycle. With overexcitation, both brake and clutch coil currents build much faster with concurrent reductions in both stop and start times, when compared with Chart 1.

Bushing Part Numbers

Browning® Bushing

| Shaft Size | Keyway Size | Bushing Number | |
|------------|-------------|-----------------|-----------|
| | | Warner Electric | Browning |
| 1/2 | 1/8 x 1/16 | 180-0002 | |
| 9/16 | 1/8 x 1/16 | 180-0003 | |
| 5/8 | 3/16 x 3/32 | 180-0004 | |
| 11/16 | 3/16 x 3/32 | 180-0005 | |
| 3/4 | 3/16 x 3/32 | 180-0006 | |
| 13/16 | 3/16 x 3/32 | 180-0007 | |
| 7/8 | 3/16 x 3/32 | 180-0008 | |
| 15/16 | 1/4 x 1/8 | 180-0009 | H Type-1 |
| 1 | 1/4 x 1/8 | 180-0010 | |
| 1 1/16 | 1/4 x 1/8 | 180-0011 | |
| 1 1/8 | 1/4 x 1/8 | 180-0012 | |
| 1 3/16 | 1/4 x 1/8 | 180-0013 | |
| 1 1/4 | 1/4 x 1/8 | 180-0014 | |
| 1 5/16 | 5/16 x 5/32 | 180-0015 | |
| 1 3/8 | 5/16 x 5/32 | 180-0016 | |
| 1 7/16 | 3/8 x 3/16 | 180-0017 | H Type-2 |
| 1 1/2 | 3/8 x 3/16 | 180-0018 | |
| 3/4 | 3/16 x 3/32 | 180-0026 | |
| 13/16 | 3/16 x 3/32 | 180-0027 | |
| 7/8 | 3/16 x 3/32 | 180-0028 | |
| 15/16 | 1/4 x 1/8 | 180-0029 | |
| 1 | 1/4 x 1/8 | 180-0030 | |
| 1 1/16 | 1/4 x 1/8 | 180-0031 | |
| 1 1/8 | 1/4 x 1/8 | 180-0032 | |
| 1 3/16 | 1/4 x 1/8 | 180-0033 | |
| 1 1/4 | 1/4 x 1/8 | 180-0034 | |
| 1 5/16 | 5/16 x 5/32 | 180-0035 | Q1 Type-1 |
| 1 3/8 | 5/16 x 5/32 | 180-0036 | |
| 1 7/16 | 3/8 x 3/16 | 180-0037 | |
| 1 1/2 | 3/8 x 3/16 | 180-0038 | |
| 1 9/16 | 3/8 x 3/16 | 180-0039 | |
| 1 5/8 | 3/8 x 3/16 | 180-0040 | |
| 1 11/16 | 3/8 x 3/16 | 180-0041 | |
| 1 3/4 | 3/8 x 3/16 | 180-0042 | |
| 1 13/16 | 1/2 x 1/4 | 180-0043 | |
| 1 7/8 | 1/2 x 1/4 | 180-0044 | |
| 1 15/16 | 1/2 x 1/4 | 180-0045 | |
| 2 | 1/2 x 1/4 | 180-0046 | |
| 2 1/16 | 1/2 x 1/4 | 180-0047 | |
| 2 1/8 | 1/2 x 1/4 | 180-0048 | |
| 2 3/16 | 1/2 x 1/4 | 180-0049 | |
| 2 1/4 | 1/2 x 1/4 | 180-0050 | |
| 2 5/16 | 5/8 x 5/16 | 180-0051 | Q1 Type-2 |
| 2 3/8 | 5/8 x 5/16 | 180-0052 | |
| 2 7/16 | 5/8 x 5/16 | 180-0053 | |
| 2 1/2 | 5/8 x 5/16 | 180-0054 | |
| 2 9/16 | 5/8 x 5/16 | 180-0055 | |
| 2 5/8 | 5/8 x 5/16 | 180-0056 | |
| 2 11/16 | 5/8 x 5/16 | 180-0057 | |

(Browning® is registered to Emerson Electric Co.)

Dodge Bushing

| Shaft Size | Keyway Size | Bushing Number | |
|------------|-------------|-----------------|-------|
| | | Warner Electric | Dodge |
| 1/2 | 1/8 x 1/16 | 180-0101 | |
| 9/16 | 1/8 x 1/16 | 180-0102 | |
| 5/8 | 3/16 x 3/32 | 180-0103 | |
| 11/16 | 3/16 x 3/32 | 180-0104 | |
| 3/4 | 3/16 x 3/32 | 180-0105 | |
| 13/16 | 3/16 x 3/32 | 180-0106 | 1210 |
| 7/8 | 3/16 x 3/32 | 180-0107 | |
| 15/16 | 1/4 x 1/8 | 180-0108 | |
| 1 | 1/4 x 1/8 | 180-0109 | |
| 1 1/16 | 1/4 x 1/8 | 180-0110 | |
| 1 1/8 | 1/4 x 1/8 | 180-0111 | |
| 1 3/16 | 1/4 x 1/8 | 180-0112 | |
| 1 1/4 | 1/4 x 1/8 | 180-0113 | |
| 1/2 | 1/8 x 1/16 | 180-0116 | |
| 9/16 | 1/8 x 1/16 | 180-0117 | |
| 5/8 | 3/16 x 3/32 | 180-0118 | |
| 11/16 | 3/16 x 3/32 | 180-0119 | |
| 3/4 | 3/16 x 3/32 | 180-0120 | |
| 13/16 | 3/16 x 3/32 | 180-0121 | 1215 |
| 7/8 | 3/16 x 3/32 | 180-0122 | |
| 15/16 | 1/4 x 1/8 | 180-0123 | |
| 1 | 1/4 x 1/8 | 180-0124 | |
| 1 1/16 | 1/4 x 1/8 | 180-0125 | |
| 1 1/8 | 1/4 x 1/8 | 180-0126 | |
| 1 3/16 | 1/4 x 1/8 | 180-0127 | |
| 1 1/4 | 1/4 x 1/8 | 180-0128 | |
| 1/2 | 1/8 x 1/16 | 180-0131 | |
| 9/16 | 1/8 x 1/16 | 180-0132 | |
| 5/8 | 3/16 x 3/32 | 180-0133 | |
| 11/16 | 3/16 x 3/32 | 180-0134 | |
| 3/4 | 3/16 x 3/32 | 180-0135 | |
| 13/16 | 3/16 x 3/32 | 180-0136 | |
| 7/8 | 3/16 x 3/32 | 180-0137 | |
| 15/16 | 1/4 x 1/8 | 180-0138 | |
| 1 | 1/4 x 1/8 | 180-0139 | |
| 1 1/16 | 1/4 x 1/8 | 180-0140 | 1615 |
| 1 1/8 | 1/4 x 1/8 | 180-0141 | |
| 1 3/16 | 1/4 x 1/8 | 180-0142 | |
| 1 1/4 | 1/4 x 1/8 | 180-0143 | |
| 15/16 | 5/16 x 5/32 | 180-0144 | |
| 13/8 | 5/16 x 5/32 | 180-0145 | |
| 17/16 | 3/8 x 3/16 | 180-0146 | |
| 1 1/2 | 3/8 x 3/16 | 180-0147 | |
| 1 9/16 | 3/8 x 3/16 | 180-0148 | |
| 1 5/8 | 3/8 x 3/16 | 180-0149 | |
| 1/2 | 1/8 x 1/16 | 180-0155 | |
| 9/16 | 1/8 x 1/16 | 180-0156 | |
| 5/8 | 3/16 x 3/32 | 180-0157 | |
| 11/16 | 3/16 x 3/32 | 180-0158 | |
| 3/4 | 3/16 x 3/32 | 180-0159 | |
| 13/16 | 3/16 x 3/32 | 180-0160 | |
| 7/8 | 3/16 x 3/32 | 180-0161 | 2012 |
| 15/16 | 1/4 x 1/8 | 180-0162 | |
| 1 | 1/4 x 1/8 | 180-0163 | |
| 1 1/16 | 1/4 x 1/8 | 180-0164 | |
| 1 1/8 | 1/4 x 1/8 | 180-0165 | |
| 1 3/16 | 1/4 x 1/8 | 180-0166 | |
| 1 1/4 | 1/4 x 1/8 | 180-0167 | |

Bushing Part Numbers

Dodge Bushing – Continued

| | | Bushing Number | | | | Bushing Number | | | | Bushing Number | |
|------------|-------------|-----------------|-------|------------|-------------|-----------------|-------|------------|-------------|-----------------|-------|
| Shaft Size | Keyway Size | Warner Electric | Dodge | Shaft Size | Keyway Size | Warner Electric | Dodge | Shaft Size | Keyway Size | Warner Electric | Dodge |
| 15/16 | 5/16 X 5/32 | 180-0168 | | 11 1/16 | 3/8 X 3/16 | 180-0235 | | 1/2 | 1/8 X 1/16 | 180-0326 | |
| 13/8 | 5/16 X 5/32 | 180-0169 | | 13/4 | 3/8 X 3/16 | 180-0236 | | 9/16 | 1/8 X 1/16 | 180-0327 | |
| 17/16 | 3/8 X 3/16 | 180-0170 | | 1 13/16 | 1/2 X 1/4 | 180-0237 | | 5/8 | 3/16 X 3/32 | 180-0328 | |
| 1 1/2 | 3/8 X 3/16 | 180-0171 | | 17/8 | 1/2 X 1/4 | 180-0238 | | 11/16 | 3/16 X 3/32 | 180-0329 | |
| 19/16 | 3/8 X 3/16 | 180-0172 | | 1 15/16 | 1/2 X 1/4 | 180-0239 | | 3/4 | 3/16 X 3/32 | 180-0330 | |
| 1 5/8 | 3/8 X 3/16 | 180-0173 | 2012 | 2 | 1/2 X 1/4 | 180-0240 | | 13/16 | 3/16 X 3/32 | 180-0331 | |
| 1 11/16 | 3/8 X 3/16 | 180-0174 | | 2 1/16 | 1/2 X 1/4 | 180-0241 | | 7/8 | 3/16 X 3/32 | 180-0332 | |
| 1 3/4 | 3/8 X 3/16 | 180-0175 | | 2 1/8 | 1/2 X 1/4 | 180-0242 | | 15/16 | 1/4 X 1/8 | 180-0333 | |
| 1 13/16 | 1/2 X 1/4 | 180-0176 | | 2 3/16 | 1/2 X 1/4 | 180-0243 | | 1 | 1/4 X 1/8 | 180-0334 | 1610 |
| 1 7/8 | 1/2 X 1/4 | 180-0177 | | 2 1/4 | 1/2 X 1/4 | 180-0244 | | 1 1/16 | 1/4 X 1/8 | 180-0335 | |
| 1 15/16 | 1/2 X 1/4 | 180-0178 | | 2 5/16 | 5/8 X 5/16 | 180-0245 | 3020 | 1 1/8 | 1/4 X 1/8 | 180-0336 | |
| 2 | 1/2 X 1/4 | 180-0179 | | 2 3/8 | 5/8 X 5/16 | 180-0246 | | 1 3/16 | 1/4 X 1/8 | 180-0337 | |
| 1/2 | 1/8 X 1/16 | 180-0185 | | 2 7/16 | 5/8 X 5/16 | 180-0247 | | 1 1/4 | 1/4 X 1/8 | 180-0338 | |
| 9/16 | 1/8 X 1/16 | 180-0186 | | 2 1/2 | 5/8 X 5/16 | 180-0248 | | 1 5/16 | 5/16 X 5/32 | 180-0339 | |
| 5/8 | 3/16 X 3/32 | 180-0187 | | 2 9/16 | 5/8 X 5/16 | 180-0249 | | 1 3/8 | 5/16 X 5/32 | 180-0340 | |
| 11/16 | 3/16 X 3/32 | 180-0188 | | 2 5/8 | 5/8 X 5/16 | 180-0250 | | 1 7/16 | 3/8 X 3/16 | 180-0341 | |
| 3/4 | 3/16 X 3/32 | 180-0189 | | 2 11/16 | 5/8 X 5/16 | 180-0251 | | 1 1/2 | 3/8 X 3/16 | 180-0342 | |
| 13/16 | 3/16 X 3/32 | 180-0190 | | 2 3/4 | 5/8 X 5/16 | 180-0252 | | 1 9/16 | 3/8 X 3/16 | 180-0343 | |
| 7/8 | 3/16 X 3/32 | 180-0191 | | 2 13/16 | 3/4 X 3/8 | 180-0253 | | 1 5/8 | 3/8 X 3/16 | 180-0344 | |
| 15/16 | 1/4 X 1/8 | 180-0192 | | 2 7/8 | 3/4 X 3/8 | 180-0254 | | 1/2 | 1/8 X 1/16 | 180-0410 | |
| 1 | 1/4 X 1/8 | 180-0193 | | 2 15/16 | 3/4 X 3/8 | 180-0255 | | 9/16 | 1/8 X 1/16 | 180-0411 | |
| 1 1/16 | 1/4 X 1/8 | 180-0194 | | 3 | 3/4 X 3/8 | 180-0256 | | 5/8 | 3/16 X 3/32 | 180-0412 | |
| 1 1/8 | 1/4 X 1/8 | 180-0195 | | 1 5/16 | 1/4 X 1/8 | 180-0262 | | 1 1/16 | 3/16 X 3/32 | 180-0413 | |
| 1 3/16 | 1/4 X 1/8 | 180-0196 | | 1 | 1/4 X 1/8 | 180-0263 | | 3/4 | 3/16 X 3/32 | 180-0414 | 1008 |
| 1 1/4 | 1/4 X 1/8 | 180-0197 | | 1 1/16 | 1/4 X 1/8 | 180-0264 | | 3/16 | 3/16 X 3/32 | 180-0415 | |
| 1 5/16 | 5/16 X 5/32 | 180-0198 | | 1 1/8 | 1/4 X 1/8 | 180-0265 | | 7/8 | 3/16 X 3/32 | 180-0416 | |
| 1 3/8 | 5/16 X 5/32 | 180-0199 | | 1 3/16 | 1/4 X 1/8 | 180-0266 | | 15/16 | 1/4 X 1/8 | 180-0417 | |
| 1 7/16 | 3/8 X 3/16 | 180-0200 | | 1 1/4 | 1/4 X 1/8 | 180-0267 | | 1 | 1/4 X 1/8 | 180-0418 | |
| 1 1/2 | 3/8 X 3/16 | 180-0201 | 2517 | 1 5/16 | 5/16 X 5/32 | 180-0268 | | 1/2 | 1/8 X 1/16 | 180-0421 | |
| 1 9/16 | 3/8 X 3/16 | 180-0202 | | 1 3/8 | 5/16 X 5/32 | 180-0269 | | 9/16 | 1/8 X 1/16 | 180-0422 | |
| 1 5/8 | 3/8 X 3/16 | 180-0203 | | 1 7/16 | 3/8 X 3/16 | 180-0270 | | 5/8 | 3/16 X 3/32 | 180-0423 | |
| 1 11/16 | 3/8 X 3/16 | 180-0204 | | 1 1/2 | 3/8 X 3/16 | 180-0271 | | 1 1/16 | 3/16 X 3/32 | 180-0424 | |
| 1 3/4 | 3/8 X 3/16 | 180-0205 | | 1 9/16 | 3/8 X 3/16 | 180-0272 | | 3/4 | 3/16 X 3/32 | 180-0425 | |
| 1 13/16 | 1/2 X 1/4 | 180-0206 | | 1 5/8 | 3/8 X 3/16 | 180-0273 | | 13/16 | 3/16 X 3/32 | 180-0426 | |
| 1 7/8 | 1/2 X 1/4 | 180-0207 | | 1 11/16 | 3/8 X 3/16 | 180-0274 | | 7/8 | 3/16 X 3/32 | 180-0427 | |
| 1 15/16 | 1/2 X 1/4 | 180-0208 | | 1 3/4 | 3/8 X 3/16 | 180-0275 | | 15/16 | 1/4 X 1/16 | 180-0428 | 1310 |
| 2 | 1/2 X 1/4 | 180-0209 | | 1 13/16 | 1/2 X 1/4 | 180-0276 | | 1 | 1/4 X 1/8 | 180-0429 | |
| 2 1/16 | 1/2 X 1/4 | 180-0210 | | 1 7/8 | 1/2 X 1/4 | 180-0277 | 3030 | 1 1/16 | 1/4 X 1/8 | 180-0430 | |
| 2 1/8 | 1/2 X 1/4 | 180-0211 | | 1 15/16 | 1/2 X 1/4 | 180-0278 | | 1 1/8 | 1/4 X 1/8 | 180-0431 | |
| 2 3/16 | 1/2 X 1/4 | 180-0212 | | 2 | 1/2 X 1/4 | 180-0279 | | 1 3/16 | 1/4 X 1/8 | 180-0432 | |
| 2 1/4 | 1/2 X 1/4 | 180-0213 | | 2 1/16 | 1/2 X 1/4 | 180-0280 | | 1 1/4 | 1/4 X 1/8 | 180-0433 | |
| 2 5/16 | 5/8 X 5/16 | 180-0214 | | 2 1/8 | 1/2 X 1/4 | 180-0281 | | 15/16 | 5/16 X 5/32 | 180-0434 | |
| 2 3/8 | 5/8 X 5/16 | 180-0215 | | 2 3/16 | 1/2 X 1/4 | 180-0282 | | 1 3/8 | 5/16 X 5/32 | 180-0435 | |
| 2 7/16 | 5/8 X 5/16 | 180-0216 | | 2 1/4 | 1/2 X 1/4 | 180-0283 | | | | | |
| 2 1/2 | 5/8 X 5/16 | 180-0217 | | 2 15/16 | 5/8 X 5/16 | 180-0284 | | | | | |
| 15/16 | 1/4 X 1/8 | 180-0223 | | 2 3/8 | 5/8 X 5/16 | 180-0285 | | | | | |
| 1 | 1/4 X 1/8 | 180-0224 | | 2 7/16 | 5/8 X 5/16 | 180-0286 | | | | | |
| 1 1/16 | 1/4 X 1/8 | 180-0225 | | 2 1/2 | 5/8 X 5/16 | 180-0287 | | | | | |
| 1 1/8 | 1/4 X 1/8 | 180-0226 | | 2 9/16 | 5/8 X 5/16 | 180-0288 | | | | | |
| 1 3/16 | 1/4 X 1/8 | 180-0227 | | 2 5/8 | 5/8 X 5/16 | 180-0289 | | | | | |
| 1 1/4 | 1/4 X 1/8 | 180-0228 | | 2 11/16 | 5/8 X 5/16 | 180-0290 | | | | | |
| 1 5/16 | 5/16 X 5/32 | 180-0229 | 3020 | 2 3/4 | 5/8 X 5/16 | 180-0291 | | | | | |
| 1 3/8 | 5/16 X 5/32 | 180-0230 | | 2 13/16 | 3/4 X 3/8 | 180-0292 | | | | | |
| 1 7/16 | 3/8 X 3/16 | 180-0231 | | 2 7/8 | 3/4 X 3/8 | 180-0293 | | | | | |
| 1 1/2 | 3/8 X 3/16 | 180-0232 | | 2 15/16 | 3/4 X 3/8 | 180-0294 | | | | | |
| 1 9/16 | 3/8 X 3/16 | 180-0233 | | 3 | 3/4 X 3/8 | 180-0295 | | | | | |
| 1 5/8 | 3/8 X 3/16 | 180-0234 | | | | | | | | | |

Warner Electric's electronic controls are designed to provide simple setup and maximum performance when used with electric clutches and brakes. Our controls offer a range of functions from on-off to torque control to over-excitation.

Selection

Many parameters beyond function can impact control selection. Warner Electric produces a variety of control options to suit numerous application requirements. Control selection parameters include:

- Mounting Location – Panel or conduit box mounting
- Switching – Relay switching of A.C. or D.C. lines or solid state switching
- Output Voltage – Controls are available for 6, 24 and 90 VDC clutch/brake coils
- Input Voltage – Controls with input power transformers are available for connection to high voltage mains.

If your application requires something special, please call us. We will be happy to provide solutions.

Clutch and Brake Controls 202

On-Off Controls

| | |
|-------------------|-----|
| CBC-100 | 204 |
| CBC-150 | 204 |
| CBC-160 | 205 |
| CBC-801 | 206 |
| CBC-802 | 207 |
| CBC-400 | 208 |
| CBC-450 | 209 |

Adjustable Torque Controls

| | |
|---------------------|-----|
| MCS-103-1 | 210 |
| MCS-805-1 | 211 |
| MCS-805-2 | 211 |
| CBC-200 | 212 |
| CBC-300 | 214 |
| CBC-500 | 216 |
| CBC-550 | 218 |
| CBC-1825R | 220 |

Overexcitation Controls

| | |
|-------------------|-----|
| CBC-700 | 222 |
| CBC-750 | 224 |

Appendix 226

Questions & Answers 227



Clutch and Brake Controls

Functions

On-Off (Basic start-stop)

Many applications are controlled by energizing the clutches and brakes with their rated D.C. voltages. Warner Electric controls are available with various mounting, input voltage and switching options.

Adjustable Torque

(Soft start-stop)

The torque transmitted by a clutch or brake is proportional to the coil current. Warner Electric offers several products that provide torque control for smooth and repeatable starts and stops.

Adjustable Accel-Decel

(Soft start-stop with full torque)

Warner Electric offers a control that allows for adjustment of the acceleration and deceleration time ramps to achieve a repeatable soft start or stop while still allowing for full torque.

Overexcitation

(Rapid cycling)

The clutch/brake speed of response can be increased for improved accuracy and performance through overexcitation, which is the application of a short high voltage pulse to provide nearly instantaneous torque.

Control Type

On-Off
Conduit Box
Mount



On-Off
Octal Socket
Mount



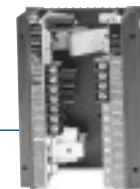
On-Off
Panel Mount



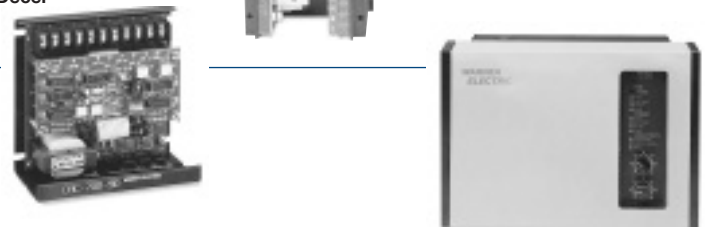
Adjustable
Torque



Adjustable Accel-Decel



Overexcitation



Clutch and Brake Controls

| Model Number | Torque No. of Channels | A.C. Control Channels | D.C. Input Voltages | Output Voltages | Customer Supplied Over-Excitation | Switching Options | Description | Page Number |
|-----------------|------------------------|-----------------------|---------------------|-----------------|-----------------------------------|--------------------------------------|---|-------------|
| CBC-100-1 | 1 | No | 120 | 90 | No | Relay A.C. | Single channel control to mount inside standard conduit box | 204 |
| CBC-100-2 | 1 | No | 220/240 | | | | | |
| CBC-150-1 | 2 | No | 120 | 90 | No | Relay A.C. | Dual channel control for clutch/brake to mount inside module conduit box | 204 |
| CBC-150-2 | 2 | No | 220/240 | | | | | |
| CBC-160-1 | | | 120 | | | | | |
| CBC-160-2 | 1 | 1 | 220/240 | 90 | No | Relay A.C. | Single channel control with torque adjust for module electrically released brakes | 205 |
| CBC-801-1 | 2 | No | 120 | 90 | No | Relay D.C. | Dual channel control for 2 clutches and/or brakes | 206 |
| CBC-801-2 | 2 | | 220/240 | | | | | |
| CBC-802 | 2 | No | 120 | 90 | No | Transistor or Relay D.C. | Dual channel control with transistor switching | 207 |
| CBC-400-90 | 2 | No | 120 | 90 | No | | Dual channel control for use with 2 clutches | 208- |
| CBC-400-24 | 2 | No | 24-30 | 24 | No | Transistor or | | |
| CBC-450-90 | 2 | No | 120/220/240/380/480 | 90 | No | Relay D.C. | and/or brakes; | 209 |
| CBC-450-24 | 2 | No | 120/220/240/380/480 | 24 | No | | Emergency stop input and AUX power supply | |
| MCS-103-1 | 2 | 1 | 120 | 90 | No | Relay D.C. | Dual channel control with torque adjust for one channel | 210 |
| MCS-805-1 | 1 | 1 | 120/240 | 35-75 | No | Relay D.C. | Single adjustable channel control for use with ER-1225 brake. | 211 |
| MCS-805-2 | | | | | | | | |
| CBC-200 | 2 | 1 | 120 | 90 | No | Transistor or Relay D.C. | Dual channel control with one adjustable current and one fixed voltage | 212- |
| CBC-200-1 | | | | | | | | 213 |
| CBC-200-2 | | | | | | | | |
| CBC-200-3 | | | | | | | | |
| CBC-300 | 2 | 2 | 120 | 90 | No | Transistor or Relay D.C. | Dual channel adjustable current control | 214- |
| CBC-300-1 | | | | | | | | 215 |
| CBC-300-2 | | | | | | | | |
| CBC-300-3 | | | | | | | | |
| CBC-500-90 | 2 | 2 | 120 | 90 | No | | Dual channel control for two clutches and/or brakes with | 216- |
| CBC-500-24 | 2 | 2 | 24-30 | 24 | No | Transistor or | | |
| CBC-550-90 | 2 | 2 | 120/220/240/380/480 | 90 | No | Relay D.C. | two torque adjust channels; | 219 |
| CBC-550-24 | 2 | 2 | 120/220/240/380/480 | 24 | No | | Emergency stop input | |
| CBC-1825-R | 2 | 2 | 120 | 90 | No | Transistor or Relay D.C. | Dual channel adjustable time ramp with short circuit protection | 220- 221 |
| CBC-700-90 | 2 | No | 120 | 90 | Yes | Transistor or | Dual channel compact overexcitation control for | 222- |
| CBC-700-24 | 2 | | 24-28 | 24 | | Relay D.C. | 24 or 90 volt clutches and brakes | 223 |
| CBC-750-6-24-90 | 2 | 2 | 120/220/240 | 6,24,90 | Yes | Transistor, Relay D.C. or Triac A.C. | Dual channel full function overexcitation control; provides input/output logic, torque adjustable current and remote inputs | 224- 225 |

CBC-100/CBC-150 On-Off Controls

Integral/Conduit Box Mounted Controls

The CBC-100 and CBC-150 series are UL listed, conduit box mounted controls for 90 volt clutches and brakes. Models are available for either 120 VAC or 220/240 VAC input.



CBC-100 series Single unit capacity

The CBC-100 mounts inside a standard Warner Electric conduit box and includes rectification and suppression circuits.

- CE
- cULus
- Compact
- Single channel
- Mounts inside conduit box



CBC-150 series Dual channel capacity

The CBC-150 replaces the cover on the standard module conduit box (part no. 5370-101-042). Provides rectification and suppression for two devices. Green LED indicates power to clutch. Red LED indicates power to brake.

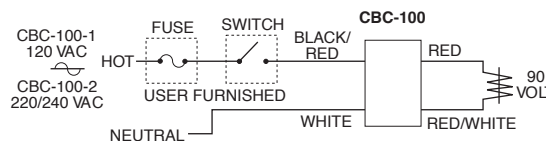
- CE
- cULus
- Dual channel
- Replaces the cover on the module conduit box

Specifications

| | CBC-100-1 | CBC-100-2 | CBC-150-1 | CBC-150-2 |
|--|--|---|--|--|
| Part No. | 6003-448-101 | 6003-448-103 | 6004-448-001 | 6004-448-002 |
| Input | 120 VAC 50/60 Hz | 220/240 VAC 50/60 Hz | 120 VAC 50/60 Hz | 220/240 VAC 50/60 Hz |
| Output | 90 VDC full wave rectified .8 Amp max. | 90 VDC half wave rectified .8 Amp | 90 VDC full wave rectified Dual .8 Amp | 90 VDC half wave rectified Dual .8 Amp |
| Ambient Temperatures | -20° to 113°F (-29° to 45°C) | | | |
| Switching | External to control, accomplished on A.C. line using relay or triac. | | | |
| | SPST | SPST | SPDT | SPDT |
| Solid State (maximum leakage current <2 mA) | 140 VAC, 1 Amp min. | 280 VAC, 1 Amp min. | 140 VAC, 2 Amp min. | 280 VAC, 2 Amp min. |
| Electro- mechanical | 120 VAC, 1 Amp min. | 240 VAC, 1 Amp min. | 120 VAC, 1 Amp min. | 240 VAC, 1 Amp min. |

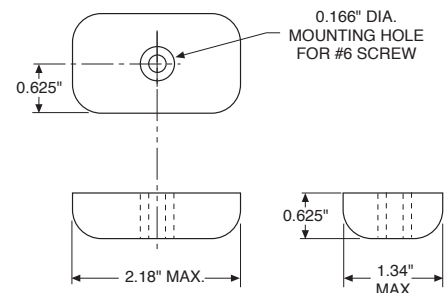
Connection diagrams

CBC-100-1, -2

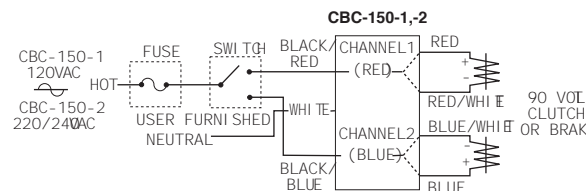


Dimensions

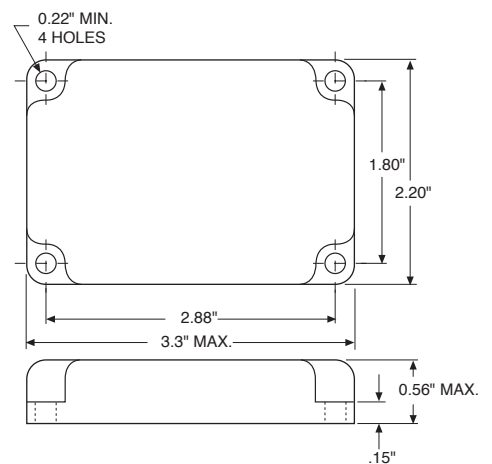
CBC-100-1, -2



CBC-150-1, -2



CBC-150-1, -2



All dimensions nominal unless otherwise specified.

Integral/Electrically Released Motor Brake Controls

CBC-160

The CBC-160 series clutch/brake controls provide a single 90 VDC adjustable output for use with any clutch/brake unit. The adjustable output will provide consistent and repeatable release for Warner Electric's 90 VDC permanent magnet electrically released brakes. The CBC-160 mounts as the cover on the standard module conduit box (part number: 5370-101-042).



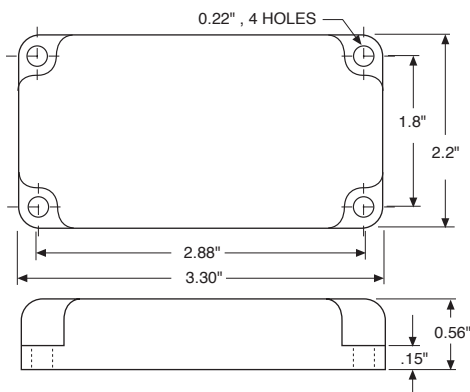
The 160-1 accommodates 120 volts A.C. motors.

- CE
- cULus
- Adjustable 30-100 VDC
- LED indicator
- 120 volt A.C. input

The power to the 160-2 control can come from either a 230 volt or 460 volt A.C. motor. Customer-provided switching is accomplished through the motor starter on the A.C. input. This allows convenient retrofit of spring-set style motor brakes and inexpensive installation of new applications.

- CE
- cULus
- Adjustable 30-100 VDC
- Power from motor
- Easy retrofit
- 230/460 motors

Dimensions

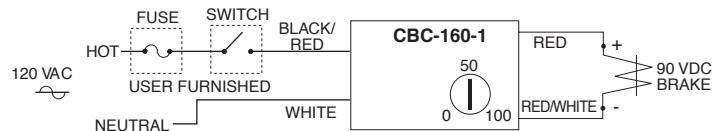


All dimensions nominal unless otherwise specified.

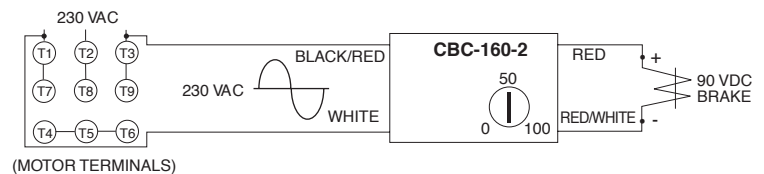
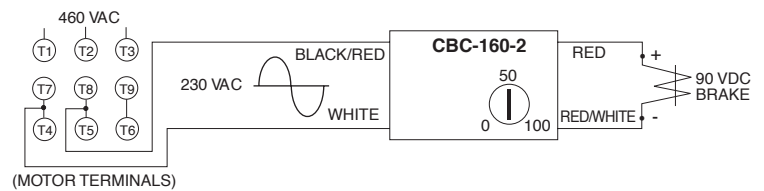
Specifications

| | CBC-160-1 | CBC-160-2 |
|----------------------|--|--|
| Part No. | 6013-448-001 | 6013-448-002 |
| Input | 120 VAC, 50/60 Hz | 220/240 VAC, 60 Hz, 1 Phase, 100 VA max. |
| Status Indicator | Red LED indicates power to the brake | — |
| Output | Single Channel, 30-100 VDC half-wave rectified nominal, 0.8 Amps maximum | |
| Ambient Temperatures | 0° to 122°F (-18° to 50°C) | |
| Switching | Accomplished through motor starter or on A.C. line using relay or triac | |

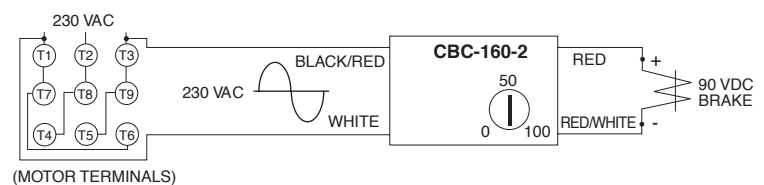
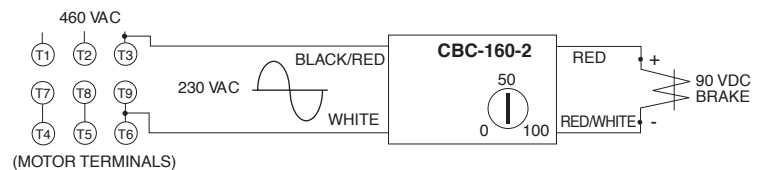
Connection Diagrams



WYE Connected Motor



DELTA Connected Motor



CBC-801 On-Off Controls

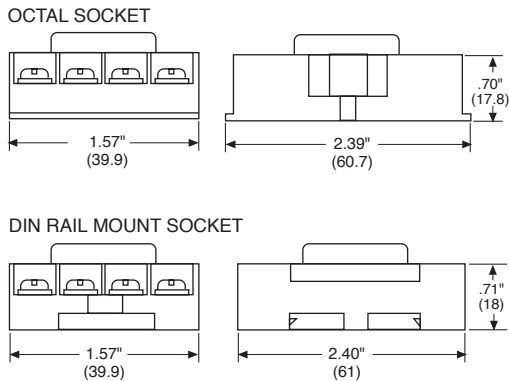
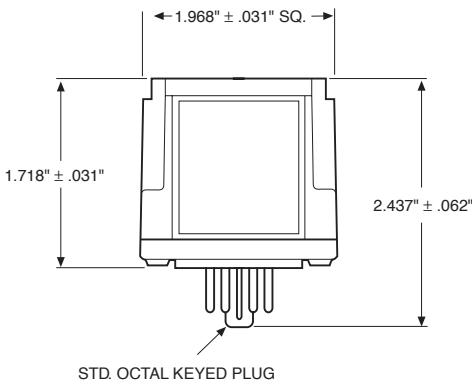
Plug-in Octal Socket Power Supplies

The CBC-801 is a basic on-off power supply that provides full voltage to a 90 volt clutch or brake and is activated by an external switch. This type of power supply is sufficient for many clutch/brake applications.

CBC-801 series Multi-unit capacity

The CBC-801 is a plug-in power supply which is used with an octal socket. The wiring connections are made at the socket. The CBC-801 will operate two units separately—or simultaneously. Octal socket is purchased separately.

Dimensions



All dimensions nominal unless otherwise specified.

- CE
- cULus
- For basic on-off operation
- Wiring connections made at octal socket
- Arc suppression circuitry extends switch life
- Fused for overload protection
- LED output indicators
- DIN rail mountable

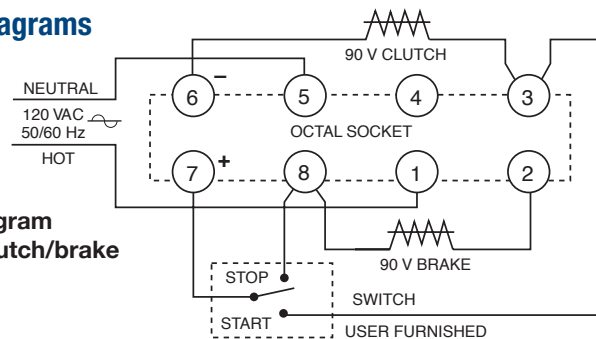


Specifications

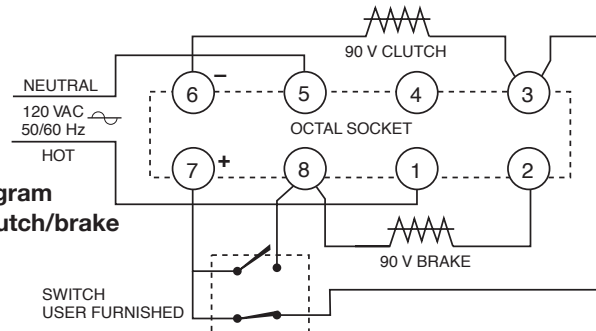
| | CBC-801-1 | CBC-801-2 |
|---------------------|--|-----------------------|
| Part No. | 6001-448-004 | 6001-448-006 |
| Input Voltage | 120 VAC, 50/60 Hz | 220/240 VAC, 50/60 Hz |
| Output | 90 VDC, 1.25 A max. | |
| Circuit Protection | Fused 1.6 Amp, 250 V fast-blo | |
| Ambient Temperature | -23° to 116°F (-31° to 47°C) | |
| Max. Cycle Rate | Limited by the clutch or brake, variable with application | |
| Switching | Single pole, double throw Minimum contact rating: 10 Amp, 28 VDC resistive or 10 Amp, 120 VAC inductive | |
| Status Indicator | Red LED indicates brake is energized, Green LED indicates clutch is energized | |
| Mounting | Two versions of octal socket are available: 6001-101-001 foot mount 6001-101-002 DIN rail mount | |

Connection Diagrams

Connection diagram for operating clutch/brake separately.



Connection diagram for operating clutch/brake simultaneously.



Plug-in Octal Socket Power Supplies

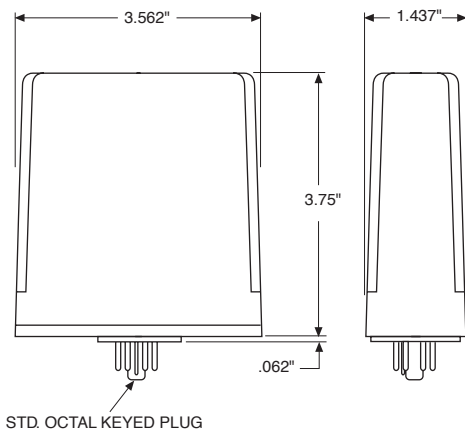


CBC-802 PLC compatible

The CBC-802 is a power supply with solid state circuits for load switching. A brake and clutch may be operated separately—or, two brakes or two clutches, one unit on at a time. The CBC-802 mounts on an octal socket (purchased separately), and the wiring connections are made at the socket terminals. Octal socket sold separately, refer to mounting specifications for part number.

- Plug-in power supply with solid state switching circuits—increases switch service life
- Adjustable time delay for controlling clutch/brake overlap
- Internally fused for overload protection
- DIN rail mountable
- LED output indicators

Dimensions

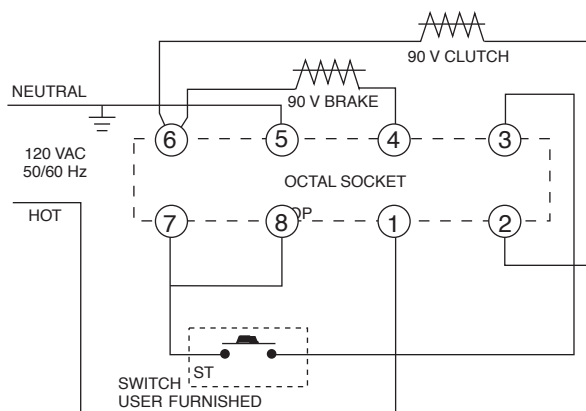


All dimensions nominal unless otherwise specified.

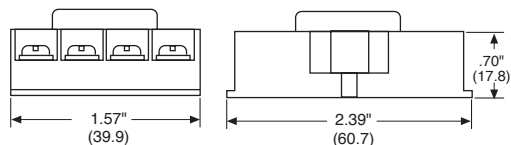
Specifications

| CBC-802 | |
|---------------------|---|
| Part No. | 6002-448-001 |
| Input | 120 VAC, 50/60 Hz |
| Output | 90 VDC, 0.5 A max. |
| Status Indicator | Red LED indicates brake energized. Green LED indicates clutch energized. |
| Circuit Protection | Fused 0.5 Amps, 250 V |
| Ambient Temperature | -20° to 113°F (-29° to 45°C) |
| Leakage Current | 500 uA max. for solid state switches |
| Max. Cycle Rate | Limited by the clutch or brake, variable with application |
| Switching | Momentary contact, maintained contact, or solid state open collector logic Minimum contact rating 20 VDC resistive, 0.01 Amps Minimum input pulse—1 millisecond |
| Adjustments | Externally adjusted potentiometer sets overlap between clutch and brake from 0 to 130 MS. |
| Mounting: | Two versions of octal socket are available: 6001-101-001 foot mount 6001-101-002 DIN rail mount |

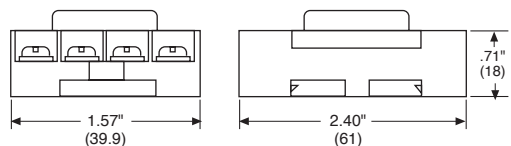
Connection Diagram



OCTAL SOCKET



DIN RAIL MOUNT SOCKET



CBC-400 On-Off Controls

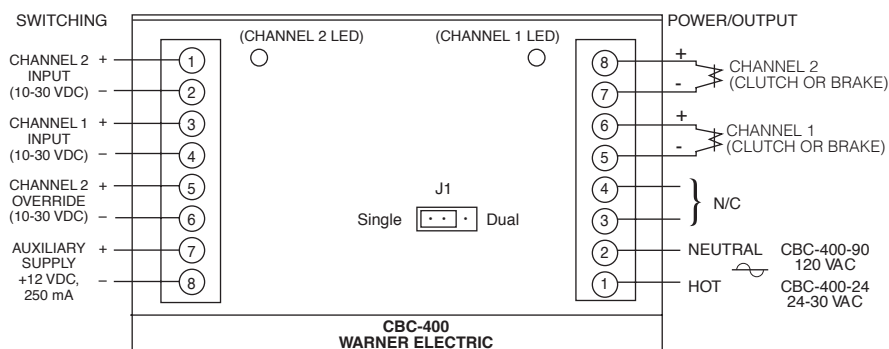
Panel Mounted Control



Specifications

| | CBC-400-90 | CBC-400-24 |
|---------------------|---|--------------------------------|
| Part No. | 6006-448-003 | 6006-448-002 |
| Input Voltage | 120 VAC | 24-30 VAC |
| Output Voltage | 90 VDC | 24 VDC |
| Output Current | 1 Amp/Channel 2 Amps Total | 5 Amps/Channel 5 Amps Total |
| Auxiliary Supply | 12 VDC 250 mA | |
| Circuit Protection | Fused 2.5 Amp, 250 V fast-blo | Fused 6.3 Amp, 250 V fast-blo |
| Ambient Temperature | +32° to 122°F (0° to 50°C) | |
| Status Indicators | Red LED indicates channel is energized. | |
| Adjustments | Jumper for single or dual operation. See Appendix for explanation. | |
| Inputs | 3 Optically isolated, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (applies full voltage to channel 1 output). | |

Connection Diagram



All dimensions nominal unless otherwise specified.

CBC-400 series Dual channel controls

The CBC-400 series is a basic on-off control which supplies 24 or 90 VDC for electric clutch/brake operation. They offer optically isolated switching inputs for start, stop, and emergency stop (E-stop). These controls can be set up to operate the two outputs alternately (single) or simultaneously (dual). Refer to the Appendix for additional setup and switching information.

- **CE**
- 24 or 90 Volt DC output
- Auxiliary 12V supply
- Fast coil suppression
- Single or dual channel operation
- Optically isolated input switching

Enclosure (Optional)

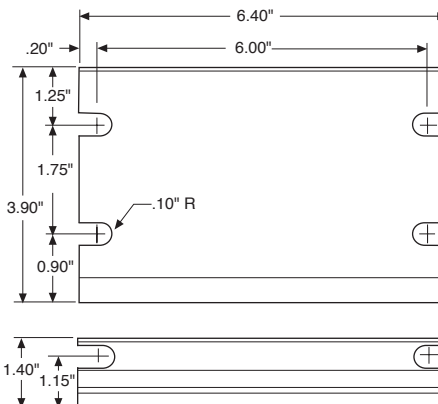


- Lift off hinge
- Quick-release latches
- Conforms to NEMA Type 13
- European Standard IEC 529, IP65

Part No. 6042-101-004

Size 8"H x 6"W x 4"D
(203.2 x 152.4 x 101.6 mm)

Dimensions



Panel Mounted Control

CBC-450 series Dual channel control with transformer for variable input voltage

The CBC-450 series is a basic on-off control which supplies 24 or 90 VDC for electric clutch/brake operation. They offer optically isolated switching inputs for start, stop, and emergency stop (E-stop). These controls can be set up to operate the two outputs, alternately (single) or simultaneously (dual). Refer to the Appendix for additional setup and switching information. The CBC-450 series has a power transformer which will operate with a 120, 220, 240, 380 or 480 VAC input.

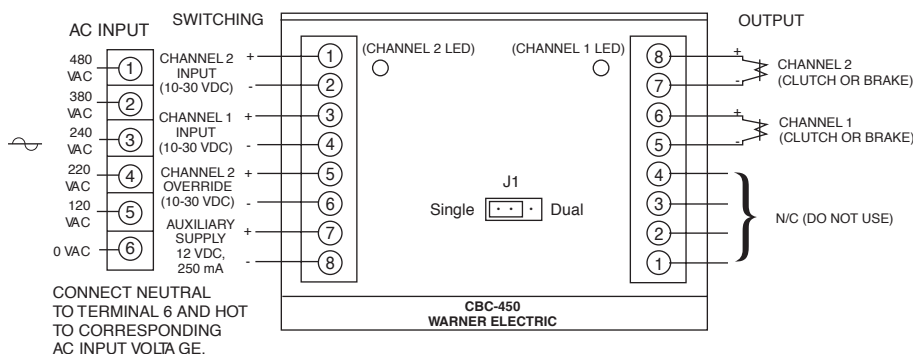


- **CE**
- 24 or 90 Volt DC output
- Auxiliary 12V supply
- Fast coil suppression
- Single or dual channel operation
- Optically isolated switching

Specifications

| | CBC-450-90 | CBC-450-24 |
|---------------------|---|--------------------------------|
| Part No. | 6006-448-006 | 6006-448-005 |
| Input Voltage | 120/220/240/380/480 VAC | |
| Output Voltage | 90 VDC | 24 VDC |
| Output Current | 1 Amp/Channel 1.2 Amps Total | 4 Amps/Channel 4 Amps Total |
| Auxiliary Supply | 12 VDC 250 mA | |
| Circuit Protection | Fused 1.5 Amp | Fused 5 Amp |
| Ambient Temperature | +32° to 122°F (0° to 50°C) | |
| Status Indicators | Red LED indicates channel is energized. | |
| Adjustments | Jumper for single or dual operation. See Appendix for explanation. | |
| Inputs | 3 Optically isolated, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (E-stop). | |

Connection Diagram



All dimensions nominal unless otherwise specified.

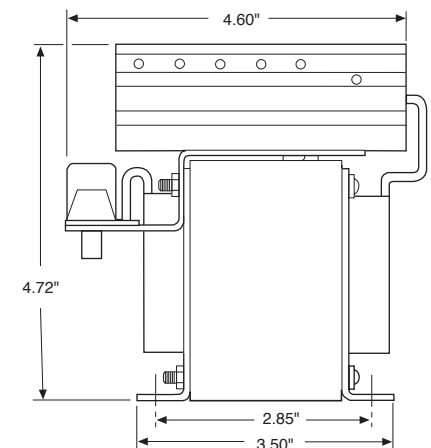
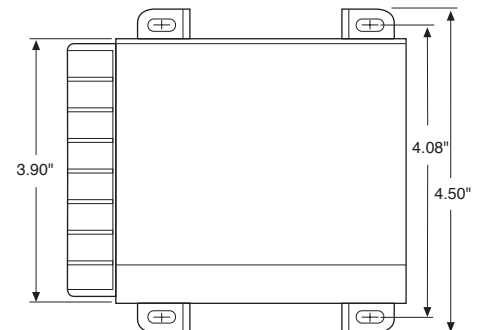
Enclosure (Optional)



- Lift off hinge
- Quick-release latches
- Conforms to NEMA Type 13
- European Standard IEC 529, IP65

| | |
|----------|---|
| Part No. | 6006-101-007 |
| Size | 6"H x 6"W x 6"D (152.4 x 152.4 x 152.4 mm) |

Dimensions



MCS-103-1 Adjustable Torque Controls

Adjustable Torque Control

The MCS-103-1 is an enclosed control complete with a cover and mounting provisions. A brake and clutch may be operated separately with this control – or up to four units, two at a time. The external wiring is connected to the terminal strip located behind the cover.

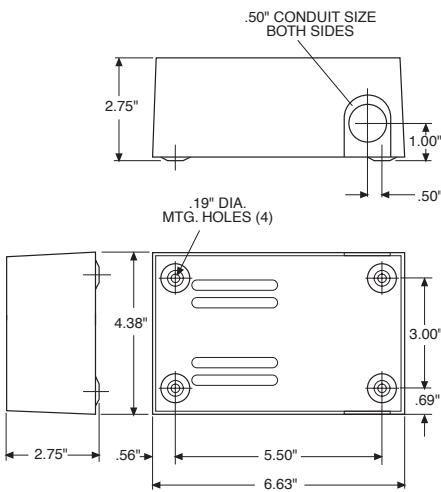


- Can be used with electrically released brakes

- Torque control for one 90 VDC clutch or brake
- Operates up to four units, two on at a time
- Easy-to-install. Compact. 120 VAC input
- Convenient terminal strip behind an easy-to-remove cover



Dimensions

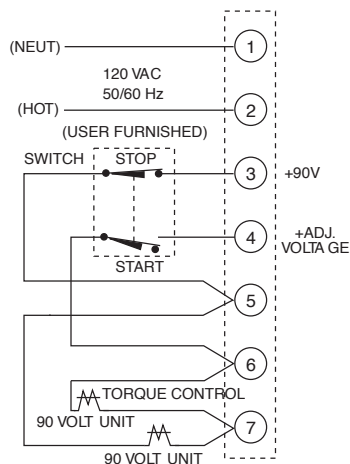


Specifications

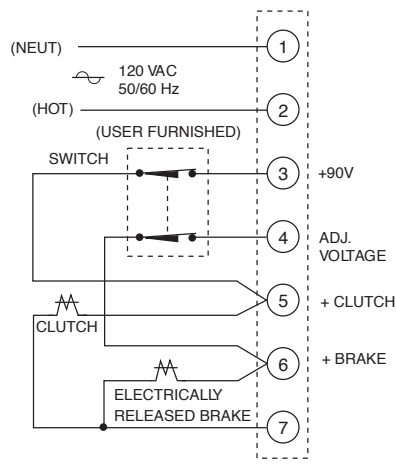
| MCS-103-1 | |
|------------------------------------|---|
| Part No. | 6010-448-002 |
| Input | 120 VAC, 50/60 Hz |
| Output | 1.25 Amp 90 V full wave rectified for one unit and adjustable from 0-90 volts full wave rectified for second unit |
| Circuit Protection | Fused 1.5 Amp, 250 V |
| Ambient Temperature | -20° to 113°F (-29° to 45°C) |
| Maximum Cycle Rate | Limited by the clutch or brake and will vary with application. |
| Mounting | Mounting centers 5-1/2" wide, 3" high. Knockouts for 1/2" conduit |
| External Switches (User furnished) | Double pole, double throw maintained contact. Minimum contact rating: 10 Amp, 28 VDC resistive or 10 Amp, 120 VAC inductive. Contact ratings given will operate all Warner Electric brake and clutch units. However, switches with ratings less than those given may be used with fractional horsepower units provided the rating is equal to or greater than the coil current. |

All dimensions nominal unless otherwise specified.

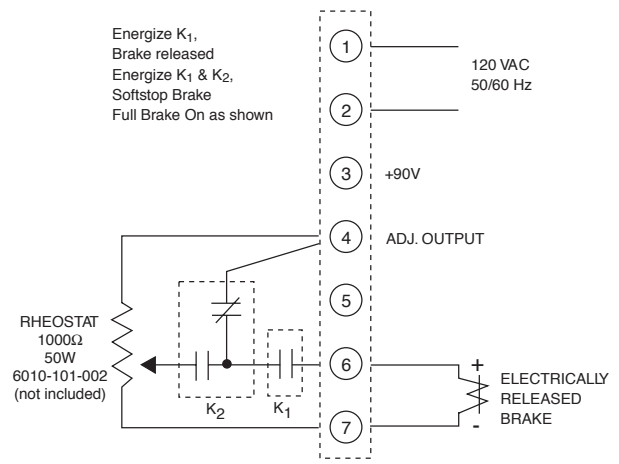
Connection Diagrams



Normal Clutch/Brake Operation
(One unit on at a time)



Clutch/Electrically Released Brake Operation
(Both units on at a time)



Soft Stop for Electrically Released Brake

MCS-805-1/MCS-805-2 Power Supply

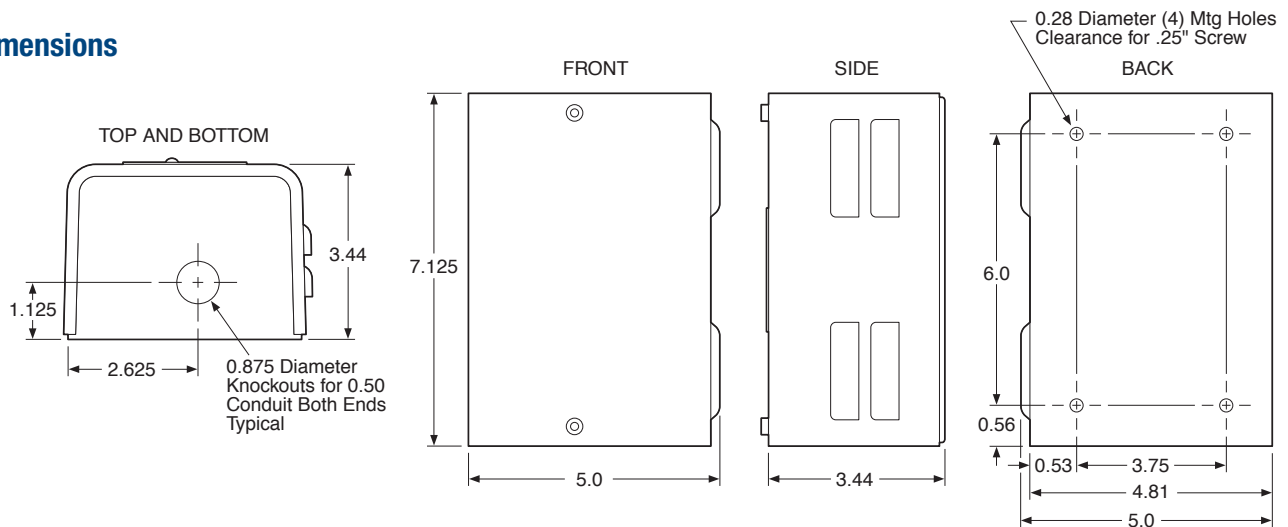
The DC voltage required to release the Warner Electric ER-1225 Brake is supplied by the MCS-805-1 or MCS-805-2 Power Supply. The correct brake release voltage—approximately 35-75 volts DC—is set by adjusting the power supply at the time of brake installation. Temperature compensating circuits provide proper operation over the entire operating range of 0°F to 150°F. Switching may be provided on either the AC or DC side of the power supply. The MCS-805-1 may be mounted on its back panel or on 1/2" conduit. The MCS-805-2 has a torque adjustment capability for soft stop applications. The MCS-805-2 requires two switching circuits when used for those applications requiring soft engagement.



Specifications

| | MCS-805-1 | MCS-805-2 |
|------------------------------------|--|---------------------------------|
| Part No. | 6090-448-006 | 6090-448-007 |
| Input | 115/230 VAC, 50/60 Hz \pm 10% | 115/230 VAC, 50/60 Hz \pm 10% |
| Output | 0.4 Amp, 35/75 VDC | 0.4 Amp, 35/75 VDC |
| Ambient Temperature | -20° to 150°F (-29° to 65°C) | -20° to 150°F (-29° to 65°C) |
| Maximum Cycle Rate | Limited by the clutch or brake and will vary with application. Consult factory for specifics. | |
| External Switches (User furnished) | For DC switching: single pole, single throw. Minimum contact rating 1 amp, 120 volts DC resistive. For AC switching: single pole, single throw. Minimum contact rating 1 amp, 120 volts AC. | |
| Circuit Protection | .75 Amp 250V Slow Blow 3 AG | |

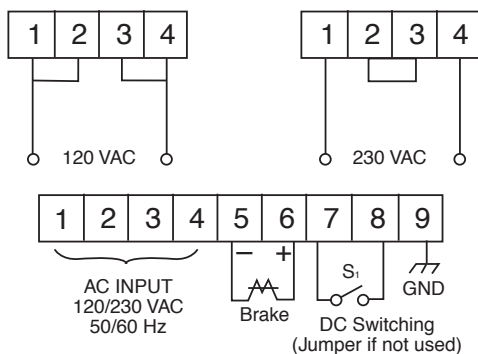
Dimensions



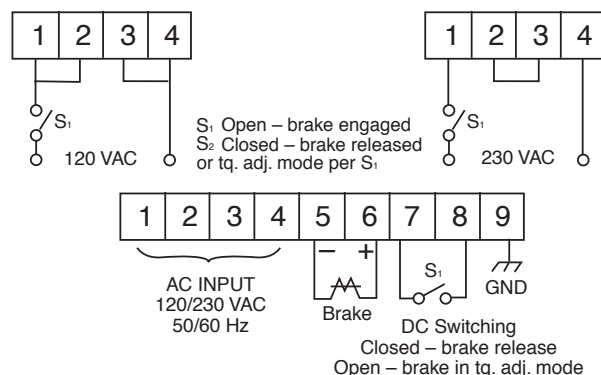
Connection Diagrams

Connect the MCS-805-1 or MCS-805-2 Power Supply per the following diagram and instructions:

MCS 805-1



MCS 805-2




For AC switching, switch may be in series with input supply.
For DC switching, use terminals 7 and 8 as shown.
DO NOT put switch in series with load on terminals 5 and 6.

CBC-200 Adjustable Torque Controls

Single or Dual Channel Adjustable Torque Control

The CBC-200 Series Controls provide single torque control when connected to any of Warner Electric's 90 volt clutches and brakes.

-  US
- Current monitored output maintains consistent torque regardless of variation in coil temperature.
- Switch selection tunes control to exactly match power requirements and operating characteristics of each clutch or brake.
- Individual torque adjust allows preset maximum torque tailored to application requirements.
- Short circuit protection, line to line.
- Torque limiting protects machine components from damage.
- Can be used with electrically released brakes.



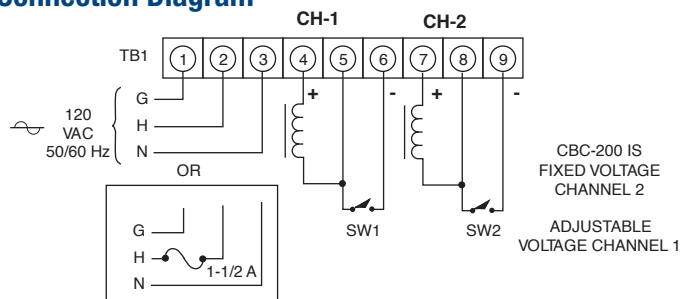
CBC-200 Series Dual channel/Single channel torque adjust

The CBC-200 is a dual channel control with one adjustable current and one fixed voltage.

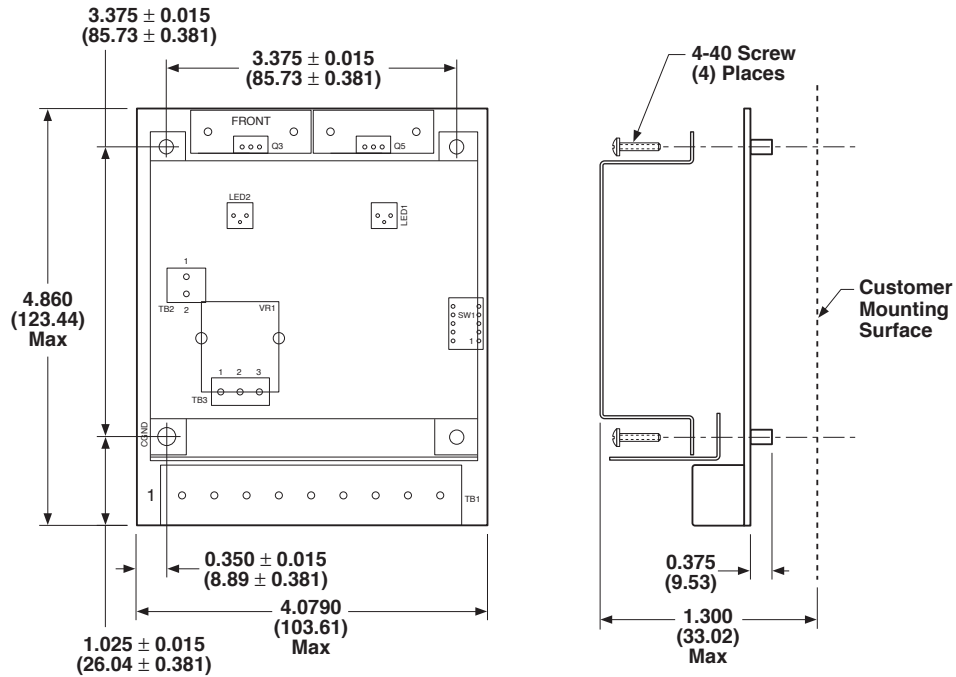
Specifications

| CBC-200 | | | | | | | | | | | | | |
|---|--|--------------|-----|-----|-----|---|---|-----------------------|----|-----|-----|-----|-----|
| Part No. | 6011-448-001 | | | | | | | | | | | | |
| Input Power | 120 VAC +10% -15%, 50/60 Hz, single phase, 215 VA max. | | | | | | | | | | | | |
| Output | Pulse-width modulated full wave rectified D.C. Constant current, switch selectable ranges, 0-90 volt | | | | | | | | | | | | |
| Ambient Temperature | +32°F to +113°F (0°C to 45°C) with plastic cover installed +32°F to +150°F (0°C to 66°C) with plastic cover removed | | | | | | | | | | | | |
| Circuit Protection | Internal line to line short circuit protection Optional customer supplied fusing on A.C. line, 1.5 Amps, 250 VAC. Fast-acting fuse recommended | | | | | | | | | | | | |
| Current Adjust (via front panel potentiometers) | Single adjustable channel | | | | | | | | | | | | |
| Status indicators | "POWER"—green LED indicates A.C. power is applied to the control. "SHORT"—red LED indicates a short circuit condition exists on one or both outputs. | | | | | | | | | | | | |
| Internal Adjustments | Set DIP switches SW1 and SW2 to suit the current draw of the connected connected clutch/brake coil: <table border="1"> <thead> <tr> <th>Switch Range</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>Max Current Draw (mA)</td> <td>60</td> <td>175</td> <td>245</td> <td>305</td> <td>533</td> </tr> </tbody> </table> | Switch Range | 1 | 2 | 3 | 4 | 5 | Max Current Draw (mA) | 60 | 175 | 245 | 305 | 533 |
| Switch Range | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| Max Current Draw (mA) | 60 | 175 | 245 | 305 | 533 | | | | | | | | |
| External Switching | Mechanical or electromechanical—customer supplied: 1 Amp, 125 V minimum rating Solid-state, NPN isolated transistor—customer supplied: 2 Amp, J250 V minimum rating. Maximum off state leakage current <1 mA | | | | | | | | | | | | |

Connection Diagram



CBC-200 Adjustable Torque Controls



Pots for remote current adjustment: 6011-101-001 single turn
 6011-101-002 ten turn

Pots for output level adjustment: 6011-101-003 single turn
 6011-101-004 ten turn


Selection Guide

| | CBC 200 | CBC 200-1 | CBC 200-2 | CBC 200-3 |
|-------------------------|---|---|---|---|
| NEMA 1 Enclosure | 6011-448-001 | 6011-448-002 | 6011-448-003 | 6011-448-004 |
| | One channel fixed One channel adjustable | One channel fixed One channel adjustable | One channel fixed One channel adjustable | One channel fixed One channel adjustable |
| | Adjustable by knob on unit | Adjustable by remote pot | Adjustable by knob on unit | Adjustable by remote pot |
| | Max. output at 100% | Max. output at 100% | Max. output Adjustable by external pot | Max. output Adjustable by external pot |
| | CBC 200-C | CBC 200-1-C | CBC 200-2-C | CBC 200-3-C |
| Chassis Design* | 6011-448-005 | 6011-448-006 | 6011-448-007 | 6011-448-008 |

* Provides the same features as the enclosed design in an open chassis mounting.

CBC-300 Adjustable Torque Controls

The CBC-300 Series Controls provide dual torque controls when connected to any of Warner Electric's 90 volt clutches and brakes.

-  UL US
- Current monitored output maintains consistent torque regardless of variation in coil temperature.
- Switch selection tunes control to exactly match power requirements and operating characteristics of each clutch or brake.
- Individual torque adjust allows preset maximum torque tailored to application requirements.
- Short circuit protection, line to line.
- Torque limiting protects machine components from damage.
- Can be used with electrically released brakes.



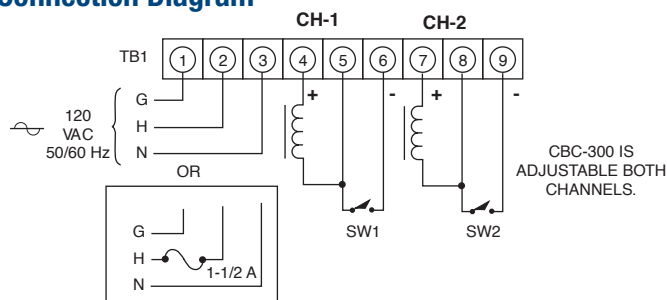
CBC-300 Series Dual channel/Dual channel torque adjust

The CBC-300 has two adjustable current channels.

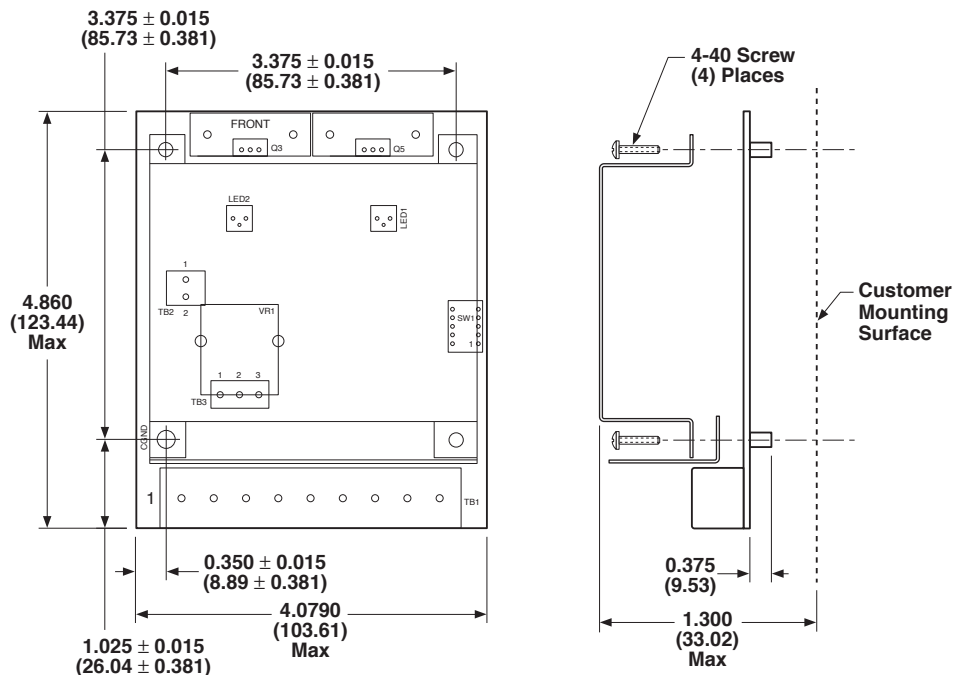
Specifications

| CBC-300 | | | | | | | | | | | | | |
|---|--|--------------|-----|-----|-----|---|---|-----------------------|----|-----|-----|-----|-----|
| Part No. | 6021-448-001 | | | | | | | | | | | | |
| Input Power | 120 VAC +10% -15%, 50/60 Hz, single phase, 215 VA max. | | | | | | | | | | | | |
| Output | Pulse-width modulated full wave rectified D.C. Constant current, switch selectable ranges, 0-90 volt | | | | | | | | | | | | |
| Ambient Temperature | +32°F to +113°F (0°C to 45°C) with plastic cover installed +32°F to +150°F (0°C to 66°C) with plastic cover removed | | | | | | | | | | | | |
| Circuit Protection | Internal line to line short circuit protection Optional customer supplied fusing on A.C. line, 1.5 Amps, 250 VAC. Fast-acting fuse recommended | | | | | | | | | | | | |
| Current Adjust (via front panel potentiometers) | Dual adjustable channels | | | | | | | | | | | | |
| Status indicators | "POWER"—green LED indicates A.C. power is applied to the control. "SHORT"—red LED indicates a short circuit condition exists on one or both outputs. | | | | | | | | | | | | |
| Internal Adjustments | Set DIP switches SW1 and SW2 to suit the current draw of the connected connected clutch/brake coil: <table border="1"> <thead> <tr> <th>Switch Range</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>Max Current Draw (mA)</td> <td>60</td> <td>175</td> <td>245</td> <td>305</td> <td>533</td> </tr> </tbody> </table> | Switch Range | 1 | 2 | 3 | 4 | 5 | Max Current Draw (mA) | 60 | 175 | 245 | 305 | 533 |
| Switch Range | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| Max Current Draw (mA) | 60 | 175 | 245 | 305 | 533 | | | | | | | | |
| External Switching | Mechanical or electromechanical—customer supplied: 1 Amp, 125 V minimum rating Solid-state, NPN isolated transistor—customer supplied: 2 Amp, J250 V minimum rating. Maximum off state leakage current <1 mA | | | | | | | | | | | | |

Connection Diagram



CBC-300 Adjustable Torque Controls



Pots for remote current adjustment: 6011-101-001 single turn
 6011-101-002 ten turn
 Pots for output level adjustment: 6011-101-003 single turn
 6011-101-004 ten turn

Selection Guide

| | CBC 300 | CBC 300-1 | CBC 300-2 | CBC 300-3 |
|-------------------------|-----------------------------|---------------------------|---|---|
| | 6021-448-001 | 6021-448-002 | 6021-448-003 | 6021-448-004 |
| NEMA 1 Enclosure | Both channels adjustable | Both channels adjustable | Both channels adjustable | Both channels adjustable |
| | Adjustable by knobs on unit | Adjustable by remote pots | Adjustable by knobs on unit | Adjustable by remote pots |
| | Max. output at 100% | Max. output at 100% | Max. output Adjustable by external pot | Max. output Adjustable by external pot |
| | CBC 300-C | CBC 300-1-C | CBC 300-2-C | CBC 300-3-C |
| Chassis Design* | 6021-448-005 | 6021-448-006 | 6021-448-007 | 6021-448-008 |

* Provides the same features as the enclosed design in an open chassis mounting.

CBC-500 Adjustable Torque Controls

Panel Mounted



Specifications

| | CBC-500-90 | CBC-500-24 |
|---------------------|---|----------------------------------|
| Part No. | 6024-448-003 | 6024-448-002 |
| Input Voltage | 120 VAC | 24-30 VAC |
| Output Voltage | 0-90 VDC | 0-24 VDC |
| Output Current | 1 Amp/Channel 2 Amps Total | 5 Amps/Channel 5 Amps Total |
| Auxiliary Supply | 12 VDC 250 mA | 12 VDC 250 mA |
| Circuit Protection | Fused 2.5 Amp, 250 V Fast-blo | Fused 6.3 Amp, 250 V Fast-blo |
| Ambient Temperature | +32° to 122°F (0° to 50°C) | |
| Status Indicators | Red LED indicates channel is energized. | |
| Adjustments | Two potentiometers for voltage adjustment of channel 1 and channel 2 output from 0 to full rated voltage. Frequency adjustment from 60 to 400 Hz to reduce clutch/brake "Hum" associated with machine frequencies. Jumper for single or dual operation. See Appendix for explanation. | |
| Inputs: | 3 Optically coupled, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (applies full voltage to channel 1 output) | |

CBC-500 series Dual torque adjustable power supplies

The CBC-500 series is a dual channel adjustable voltage control with optically isolated input switching for 24 and 90 volt electric clutches and brakes. These controls can be set up to energize the two outputs alternately (single) or simultaneously (dual). Refer to the Appendix for additional setup and switching information.

• CE

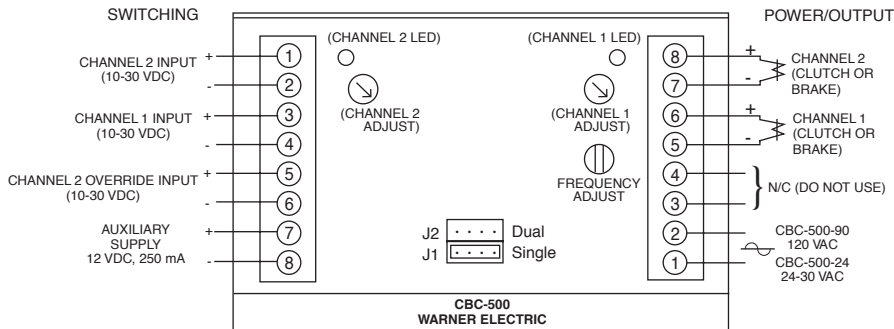
- Dual adjustable channels
- Optically isolated input switching
- Single or dual channel operation
- Auxiliary 12V supply
- Can be used with electrically released brakes

Enclosure (Optional)



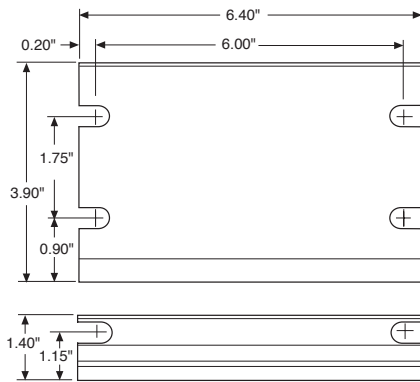
- Lift off hinge
- Quick-release latches
- Conforms to NEMA Type 13
- European Standard IEC 529, IP65

Connection Diagram



All dimensions nominal unless otherwise specified.

Dimensions



| | |
|----------|---|
| Part No. | 6042-101-004 |
| Size | 8"H x 6"W x 4"D (203.2 x 152.4 x 101.6 mm) |

CBC-550 Adjustable Torque Controls

Panel Mounted

CBC-550 series Dual adjustable with power transformer

The CBC-550 series is a dual channel adjustable voltage control with optically coupled switching for 24 and 90 volt electric clutches and brakes. These controls can be set up to energize the two outputs alter-nately (single) or simultaneously (dual). Refer to the Appendix for additional setup and switching information.

The CBC-550 series has a power transformer which will operate with a 120, 220, 240, 380, or 480 VAC input.



- Dual adjustable channels
- Optically isolated input switching
- Single or dual channel operation
- Can be used with electrically released brakes



Specifications

| | CBC-550-90 | CBC-550-24 |
|---------------------|---|--------------------------------|
| Part No. | 6024-448-006 | 6024-448-005 |
| Input Voltage | 120/220/240/380/480 VAC | |
| Output Voltage | 0-90 VDC | 0-24 VDC |
| Output Current | 1 Amp/Channel 1.2 Amps Total | 4 Amps/Channel 4 Amps Total |
| Auxiliary Supply | 12 VDC 250 mA | |
| Circuit Protection | Fused 1.5 Amp, 250 V fast-blo | Fused 5 Amp, 250 V fast-blo |
| Ambient Temperature | +32° to 122°F (0° to 50°C) | |
| Status Indicators | Red LED indicates channel is energized. | |
| Adjustments | Two potentiometers for voltage adjustment of channel 1 and channel 2 output from 0 to full rated voltage. Frequency adjustment from 60 to 400 Hz to reduce clutch/brake "Hum" associated with machine frequencies. Jumper for single or dual operation. See Appendix for explanation. | |
| Inputs | 3 Optically coupled, 10-30 VDC, 3-9 mA for Channel 1, Channel 2 and Channel 2 override (applies full voltage to channel 1 output) | |

Enclosure (Optional)



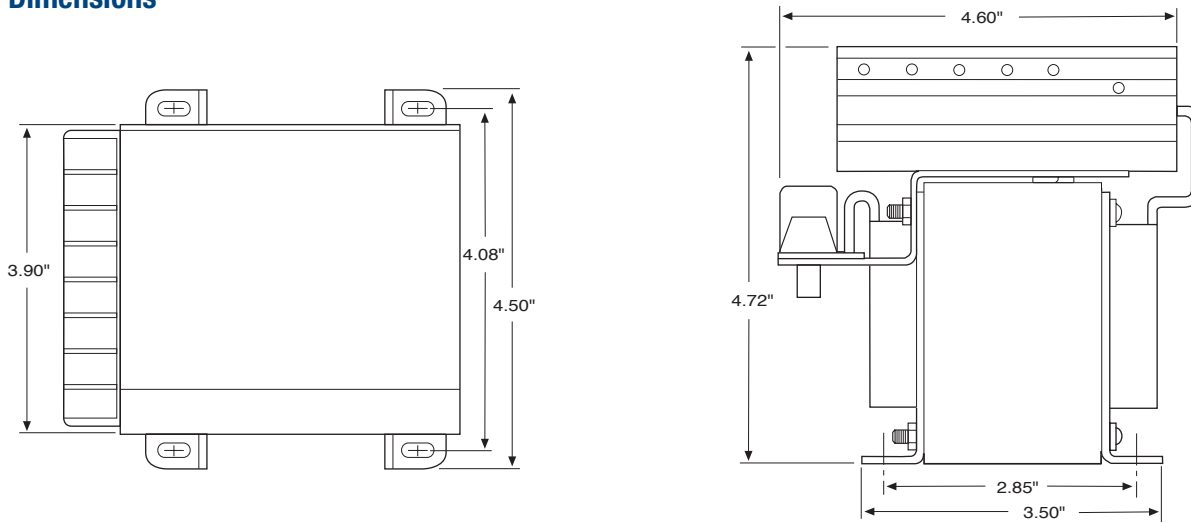
- Lift off hinge
- Quick-release latches
- Conforms to NEMA Type 13
- European Standard IEC 529, IP65

| | |
|----------|---|
| Part No. | 6006-101-007 |
| Size | 6"H x 6"W x 6"D (152.4 x 152.4 x 152.4 mm) |

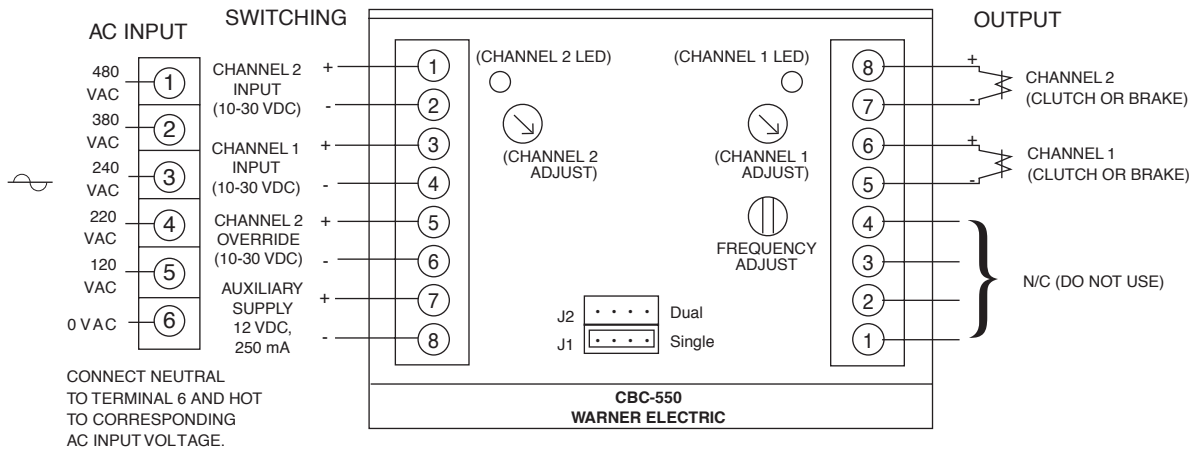
CBC-550 Adjustable Torque Controls

Panel Mounted

Dimensions



Connection Diagram



All dimensions nominal unless otherwise specified.

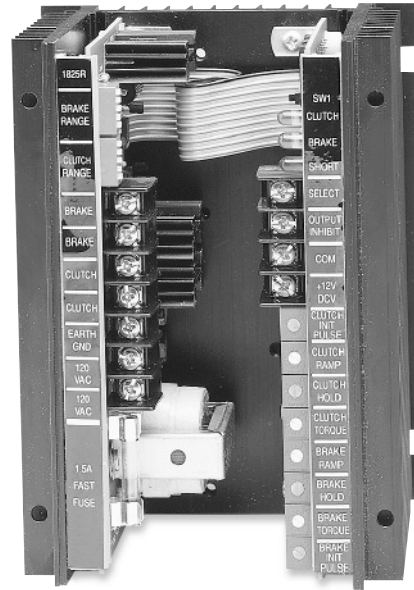
CBC-1825R Adjustable Torque Controls

Panel Mounted

CBC-1825R series

The CBC-1825R is designed to provide consistent and repeatable acceleration and deceleration when used with Warner Electric 90 VDC clutches and brakes. Current to each channel is introduced along an adjustable time ramp and monitored continuously. Adjustments include initial pull-in pulse, hold level, maximum torque, and ramp time. LEDs are provided on the circuit board to indicate power is applied to the clutch or brake unit.

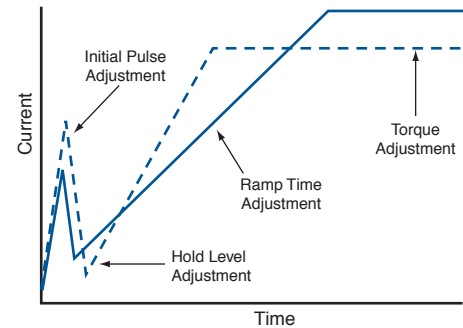
Note: It is recommended that the auto-gap springs be removed from the clutch and brake for successful accel-decel application.



Specifications

| CBC-1825R | |
|---------------------|---|
| Part No. | 1825-448-001 |
| Input Voltage | 120 VAC, 50/60 Hz, 100 VA maximum |
| Output Current | Current driven PWM, compatible with 90 VDC clutch/brake (switch selectable current output) |
| Auxiliary Supply | 12 VDC 250 mA |
| Circuit Protection | Input Fused 1.5 Amp, 250 V fast-blo clutch and brake outputs are short circuit protected |
| Status Indicators | Clutch and brake LEDs indicate output is energized Short circuit LED indicates a fault |
| Ambient Temperature | 0° to 122°F (-18° to 50°C) |
| Switching | Contact rating: 15 mA @ 15 V, open collector NPN 2mA maximum allowable leakage current and 2 V maximum saturation voltage |

Set-up

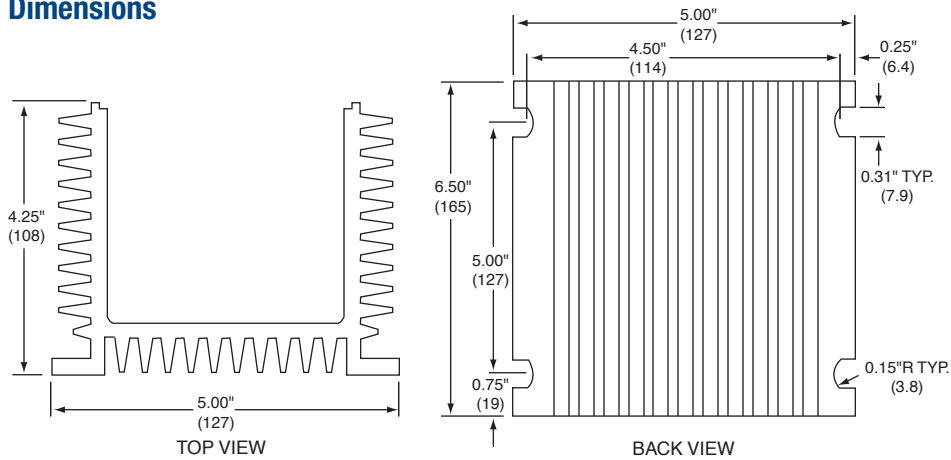


All dimensions nominal unless otherwise specified.

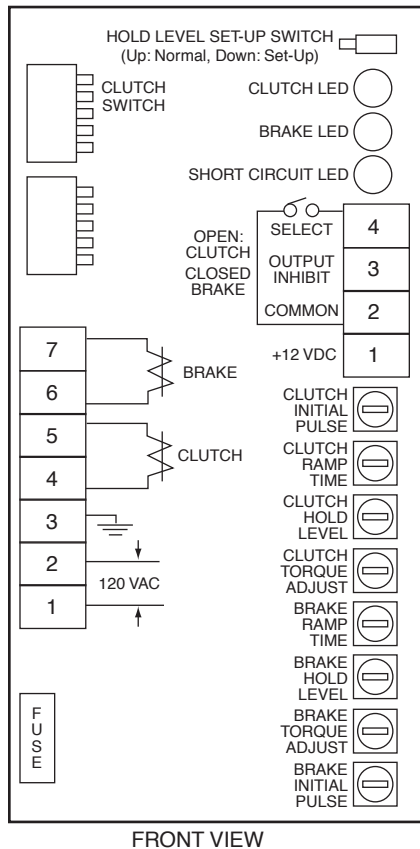
CBC-1825R Adjustable Torque Controls

Panel Mounted

Dimensions



Connection Diagram



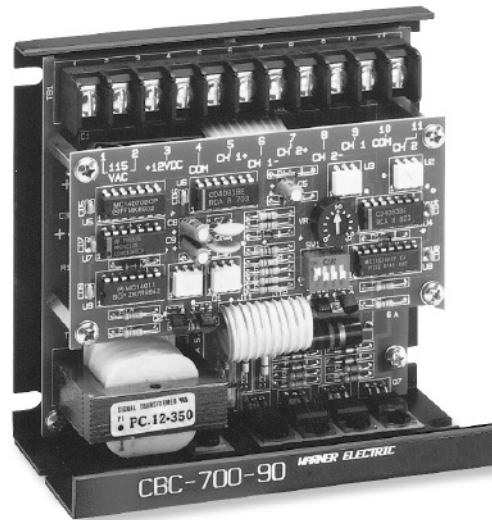
CBC-700 Overexcitation Controls

General Purpose OEX Control

CBC-700 Series

Simple, compact, high performance OEX control for either 90 or 24 VDC clutches and brakes. OEX spike duration and anti-overlap times delay are adjustable. Two optically isolated inputs.

- **CE**
- High performance
- Switch selectable OEX duration
- Force decay suppression with adjustable anti-overlap time delay
- Compact, flexible mounting
- Models for 24 or 90 volt clutches and brakes
- Cycle rate limited by clutch/brake



Specifications

| | CBC-700-90 | CBC-700-24 |
|--|--|------------------------|
| Part No. | 6042-448-003 | 6042-448-002 |
| Input | 120 VAC, 50/60 Hz | 24-28 VAC, 50/60 Hz |
| Output Voltages | | |
| Steady State | 90 VDC | 24 VDC |
| Overexcitation | 340 VDC | 105 VDC |
| Output Current (Per channel alternately) | .5 Amps | 3.5 Amps |
| OEX Pulse Duration | Adjustable through logic board dip switches (see service manual) | |
| Inputs | Two-optically isolated (10-30 VDC) | |
| Ambient Temperature Range | 0°F to 140°F (-18°C to +60°C) | |
| Maximum Off State Leakage | <2 mA (inputs) | |
| Circuit Protection | 2.5A Slo-Blo (5 x 20 mm) | 5A Slo-Blo (5 x 20 mm) |
| Auxiliary Supply | 12 VDC, 250 mA maximum | |

Enclosure (Optional)



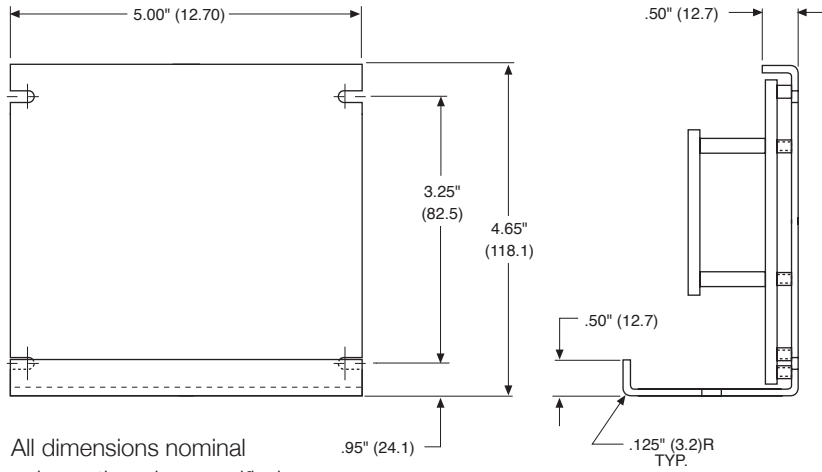
- Lift off hinge
- Quick-release latches
- Conforms to NEMA Type 13
- European Standard IEC 529, IP65

| | |
|-----------------|---|
| Part No. | 6042-101-004 |
| Size | 8"H x 6"W x 4"D (203.2 x 152.4 x 101.6 mm) |

CBC-700 Overexcitation Controls

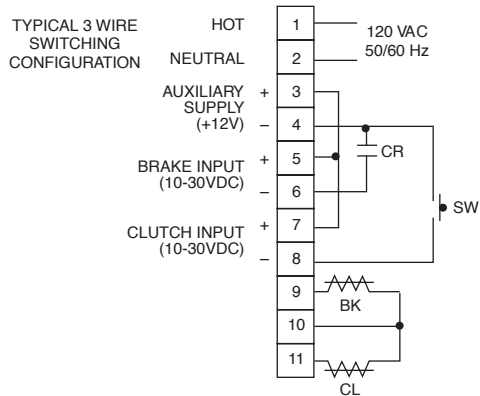
General Purpose OEX Control

Dimensions



All dimensions nominal unless otherwise specified.

Connection Diagram



NOTE: CR, SW user furnished switch options for use with control.
CR normally open relay contact
SW normally open push button switch

CBC-750 Overexcitation Controls

Rapid Acceleration/Deceleration

CBC-750 Series Dual channel, current based OEX with switching logic

Warner Electric's CBC-750 series of Constant Current Overexcitation Clutch/Brake Controls are solid-state electronic controls designed to increase the cycle rate capabilities and accuracies of electromagnetic clutches and brakes. The controls accomplish this by sending a momentary high voltage overexcitation spike to the clutch and/or brake magnetic coil to build a high density magnetic flux field almost instantaneously. By using overexcitation, the response time is reduced as dramatically as performance is increased. For example, the current build up time of a 5 inch, 6 volt magnet is reduced from 84 milliseconds to 2 milliseconds.

The CBC-750 user selects either 120, 220 or 240 VAC operation at the time of installation. Models for 6 volt, 24 volt, or 90 volt clutches and brakes are available.

LED indicators on the faceplate of each control tell the user the status of input signals, output activation and any auxiliary inputs. A reset switch resets the output should a short be detected. Remote torque adjust potentiometer inputs are also provided. Appropriate current range for each size clutch or brake is selected by a dip switch. Constant current for each level is assured by the control's design.

- Maintains torque at preset levels regardless of temperature variations
- Automatically controls OEX pulse duration for optimum response without overheating coils
- Automatically prevents clutch and brake "overlap"
- Configurable as an analog follower control through remote top input
- Integral switching logic through auxiliary, inhibit and override inputs



Shown with optional cover, part number 6041-101-004



- High performance OEX control
- Constant current output capability
- Models for 6, 24, and 90 V clutches and brakes
- Outputs short circuit protected.
- AC/DC optically isolated inputs
- Transformer isolation Remote torque potentiometer capability
- Input/Output inhibit functions
- Switch selectable OEX function
- Automatic CH1/CH2 anti-overlap feature
- Heavy duty suppression circuits
- Selectable output current ranges
- Remote status indicators inputs and outputs

Specifications

| | CBC-750-6 | CBC-750-24 | CBC-750-90 |
|-----------------------------|--|----------------------|----------------------|
| Part No. | 6041-448-001 | 6041-448-002 | 6041-448-003 |
| Input Power | 120/220/240 VAC, $\pm 10\%$, 50/60 Hz, 350 VA (switch selectable) | | |
| Control Inputs | Opto-isolated 10-30 VDC @ 10-35 mA nominal sinking or sourcing, or 24 VAC (50/60Hz) @ 22 mA nominal, or 120 VAC (50/60 Hz) @ 20 mA nominal | | |
| Clutch/brake Output | | | |
| Steady State Output | | | |
| Current controlled | .910 to 4.34 A max. | .227 to 1.175 A max. | .060-.310 A max. |
| Current Rise Time | Dependent on clutch/brake size | | |
| Current Fall Time | Depending on clutch/brake size | | |
| Overexcitation Voltage | 75 VDC nom. | 240 VDC nom. | 450 VDC nom. |
| Overexcitation Time | Automatic adjustment by control feedback | | |
| Anti-overlap Time | Automatic adjustment by control feedback | | |
| Power Supply Output | 12 VDC, ± 0.6 VDC, 250 mA max. | | |
| Auxiliary Indicator Outputs | Opto-isolated NPN transistors 24 VDC maximum, 20 mA max., reverse polarity protected | | |
| Circuit Protection | Internal short circuit protection on each output channel. | | |
| Fusing | | | |
| AC Input Line | 2 Amp, 250 V Slo-Blo | | |
| OEX Supply | 10 Amp, 32 V Slo-Blo | 5 Amp, 250 V Slo-Blo | 1 Amp, 250 V Slo-Blo |

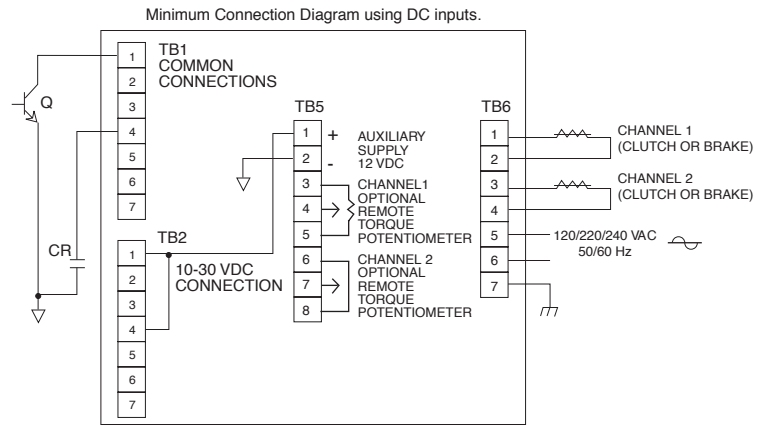
CBC-750 Overexcitation Controls

Rapid Acceleration/Deceleration

Seven optically isolated inputs accept 10-30V A.C./D.C. (TB2) or 120 VAC (TB3), configured through set-up switches

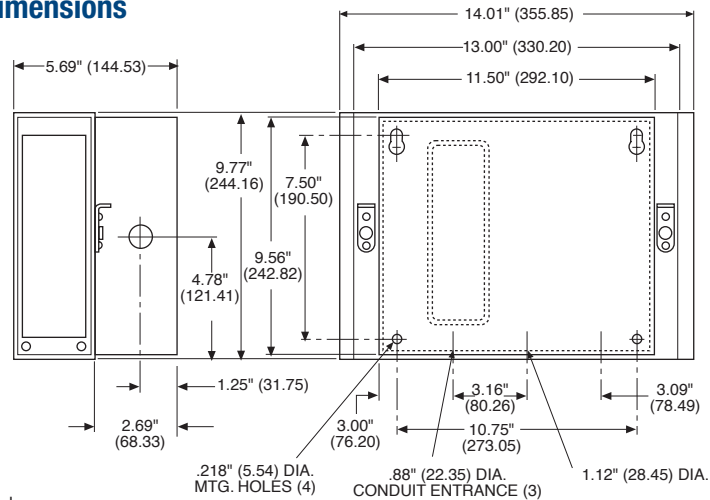
1. Channel 2 Input
2. Channel 2 Input Inhibit (disregards channel 2 input signal)
3. Auxiliary Input
4. Channel 1 Input
5. Channel 1 Input Inhibit (disregards channel 1 input signal)
6. Output Inhibit (deactivates both output channels)
7. Channel 2 Override (applies full voltage to channel 1 output)

Connection Diagram



NOTE: Q, CR user furnished switch options for use with control.
 Q NPN transistor
 CR normally open relay contact

Dimensions



All dimensions nominal unless otherwise specified.

Setup Switches

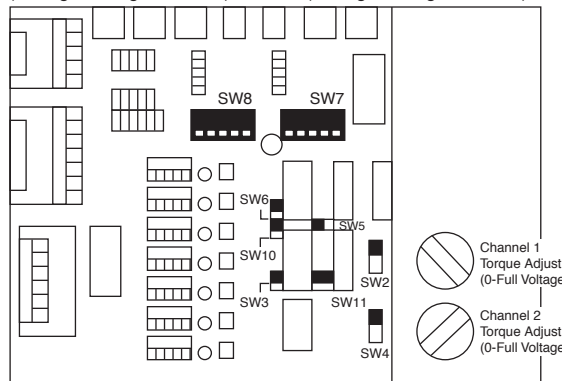
SW1: AC Voltage selection switch on terminal board inside control unit

Max. Current Output

(SW7 & SW8 settings)

| Nominal Voltage | 1 | 2 | 3 | 4 | 5 |
|-----------------|-------|-------|-------|-------|-------|
| 6 | 0.910 | 2.35 | 3.183 | 3.760 | 4.340 |
| 24 | 0.227 | 0.641 | 0.881 | 0.940 | 1.175 |
| 90 | 0.060 | 0.176 | 0.256 | 0.282 | 0.310 |

SW8 Channel 2 current range selector (settings in diagram below)
SW7 Channel 1 current range selector (settings in diagram below)



All switches are in the down (v) position from factory

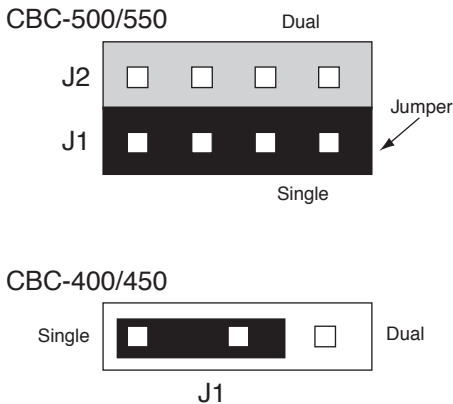
- SW6** Channel 2 OEX enable (v) / disable (v)
- SW10** Channel 1 input invert (v) / (v)
- SW3** Level/pulse selector level (v) / pulse (v)
- SW5** Channel 1 OEX enable (v) / disable (v)
- SW2** Channel 1 local (v) or remote (v) torque adjust
- SW4** Channel 2 local (v) or remote (v) torque adjust
- SW11** Auxiliary input selector Channel 1 (v) / Channel 2 (v)

Appendix

CBC-400/450/500/550 Single vs. Dual Operation

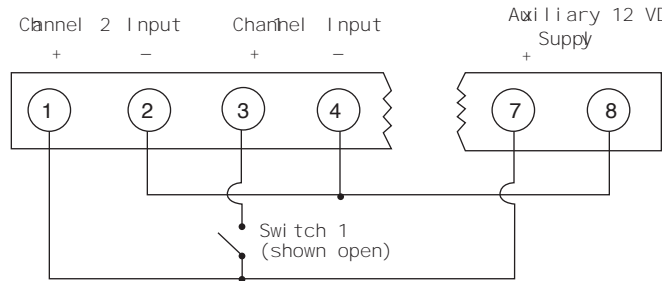
The CBC 400 and 500 series controls allow operation in either a single or dual mode. The mode of operation is determined via the position of a jumper on the main control board.

The controls are shipped with the jumper in the J1 or single mode position. A variety of output logic can be accomplished via the single/dual jumper position and whether the control is wired to one input switching device (2-wire mode) or two input switching devices (3-wire mode). The following diagrams show how each channel (output) of the control can be either alternately or simultaneously energized.



2-wire Switching Option

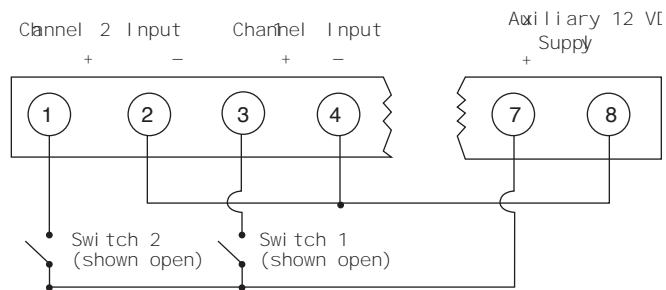
Control's switching terminal block



| Jumper Mode | Switch 1 | Channel 1 | Channel 2 |
|-------------|----------------|----------------|----------------|
| J1-Single | Open Closed | Off Powered | Powered Off |
| J2-Dual | Open Closed | Powered Off | Powered Off |

3-wire Switching Option

Control's switching terminal block

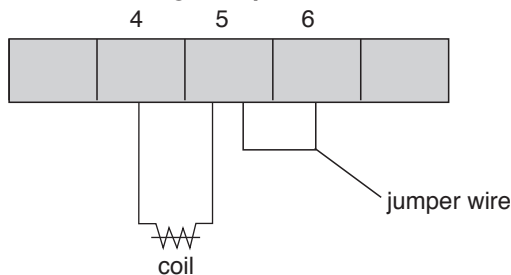


| Jumper Mode | Switch 1 | Switch 2 | Channel 1 | Channel 2 |
|-------------|----------------|----------------|-------------------|-------------------|
| J1-Single | Closed Open | Open Closed | Latched On Off | Off Latched On |
| J2-Dual | Closed Open | Open Closed | Off Latched On | Off Latched On |

1. What transformers can be used with controls requiring 24-30 VAC input?

| Manufacturer | Part Number | Primary | Secondary |
|--------------|-------------|-------------|--------------|
| Abbott | 6B 12-160 | 115 VAC | 24V @ 6 amps |
| Quality | 6-K-119VBR | 115/230 VAC | 24V @ 8 amps |
| Signal | 24-6 | 115 VAC | 24V @ 6 amps |
| Signal | DP24-6 | 115/230 VAC | 24V @ 6 amps |
| Triad | F-260-U | 115 VAC | 24V @ 6 amps |

2. When a single clutch or brake is used with a CBC-200 and no switch is used, a jumper wire is required across terminals 5 & 6 to get output at terminals 4 & 5.



3. What is the difference between a MCS-801 and a CBC-801-1 or between a MCS-103 and a MCS-103-1?

There is no performance difference between the MCS-103 and MCS-103-1. There is no performance difference between the MCS-801 and CBC-801-1. The CBC-801-1 is roughly 1/4" shorter than the MCS-801. The units wire and work exactly the same.

4. Which power supplies can be used with the SF 1525HT and SFC 1525HT coil?

The SF and SFC 1525 High Torque clutch coils require .794 amps of current to provide full rated torque. The following power supplies and controls will provide the needed power.

| | | | |
|---------|-----------|-----------|-----------|
| CBC-100 | .8 amps | CBC-450 | 1 amp |
| CBC-150 | .8 amps | MCS-103-1 | 1.25 amps |
| CBC-801 | 1.25 amps | CBC-500 | 1 amp |
| CBC-400 | 1 amp | CBC-550 | 1 amp |

5. Can I use a CBC-160 with a variable frequency drive and AC motor?

No. As the voltage to the drive is varied, the output to the electrically released brake would also vary. This would cause the brake to re-engage when it should be released.

6. Which power supplies offer a 12 VDC power source that could be used to power auxiliary switch inputs such as inductive or photoelectric sensors?

CBC-400, CBC-450, CBC-500,
CBC-550, CBC-700, CBC-750

7. We plan to use a PLC in the application. Does that impact our choice of control or power supply?

The CBC-801s and MCS-103-1 are not very PLC friendly. Both require a 10 amp relay for switching which is not very common for PLCs. Alternatives would be CBC-150 or CBC-500/550 respectively which are more 'PLC-Friendly'.

8. Which of the controls would allow for the independent operation of two clutches or two brakes?

Four controls allow for completely independent operation of two clutches or brakes. That is, that a clutch and brake can both be on at once, both off at once, or one on and one off. These controls are:

CBC-801-1 and CBC-801-2, MCS-103-1,
CBC-200, CBC-300

The CBC-400/450 and CBC-500/550 allow for operation of both channels on at once, both channels off at once or cycling between channel one and two. However, in the both-on/both-off mode, you cannot also do independent single channel operation.

9. Our PLC can provide 24 or 90 volts output. Why do we need a separate power supply at all?

There are two reasons to use a Warner Electric control or power supply with clutches and brakes. First, the electric coil within clutches and brakes can create a significant back EMF spike when turned off. This can damage PLC circuits (some PLCs include a diode for protection). All Warner Electric controls and power supplies include a suppression network to protect upstream electrical components from the back EMF spike. Second, this same suppression network will speed the collapse of the magnetic field within a clutch or brake. Without the suppression circuit, a clutch and brake will often overlap each other in performance with resulting poor machine performance.

10. Which controls can be used with electrically released brakes?

The CBC-160-1 and CBC-160-2 are designed specifically to use with the conduit box of EM and EUM electrically released brake designs. The CBC-160-1 and CBC-160-2 can also be used with ER and FB brake designs.

The MCS-103-1, CBC-200, CBC-300 and CBC-500/550 can all be used with ER, FB as well as UM-FBC, EM and EUM-FBB and EM and EUM-MBFB designs.

The MCS 805-1 and MCS 805-2 are for use only with the ER 1225 brakes. The ERS series brakes can be used with the CBC-100 or CBC-801 power supplies.

Ordering Information

| Model | Part Number | Page |
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| CBC-100-1 | 6003-448-101 | 204 |
| CBC-100-2 | 6003-448-103 | 204 |
| MCS-103-1 | 6010-448-002 | 210 |
| CBC-150-1 | 6004-448-001 | 204 |
| CBC-150-2 | 6004-448-002 | 204 |
| CBC-160-1 | 6013-448-001 | 205 |
| CBC-160-2 | 6013-448-002 | 205 |
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| CBC-200-1-C | 6011-448-006 | 213 |
| CBC-200-2-C | 6011-448-007 | 213 |
| CBC-200-3-C | 6011-448-008 | 213 |
| CBC-300-C | 6021-448-005 | 215 |
| CBC-300-1-C | 6021-448-006 | 215 |
| CBC-300-2-C | 6021-448-007 | 215 |
| CBC-300-3-C | 6021-448-008 | 215 |
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| Octal Socket, DIN Rail Mount | 6001-101-002 | 206, 207 |
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| Optional Enclosure: CBC-400, CBC-500, CBC-700 | 6042-101-004 | 208, 217, 222 |
| Optional Enclosure CBC-450, CBC-550 | 6006-101-007 | 209, 218 |
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| MCS-805-2 | 6090-448-007 | 211 |

Packaged Performance Products Service Parts

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UniModules

| | |
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| UM Series Clutch and Clutch/Brake Combinations | 232 |
| UM-C Series Ceramic Faced Clutch/Brakes | N/A |
| Smooth-Start Clutch/Brakes | 268 |

Electro Modules

| | |
|---|-----|
| EM Series Modular Clutches, Brakes and Motor Brakes | 248 |
|---|-----|

Enclosed UniModules

| | |
|---|-----|
| EUM Series Clutch and Clutch/Brake Combinations | 262 |
| EUM-W Series Washdown Clutch/Brakes | 262 |

Shaft and Base Mounted Units

Electro Clutches and Brakes

| | |
|--|-----|
| EC Series Shaft Mounted Clutches | 270 |
| EB Series Shaft Mounted Brakes | 276 |

Advanced Technology Clutches and Brakes

| | |
|-------------------------------|-----|
| ATC Series Clutches | 282 |
| ATB Series Brakes | 284 |

Packaged Stationary Field Clutches

| | |
|------------------------|-----|
| SFP Clutches | N/A |
|------------------------|-----|

Electro Pack

| | |
|--|-----|
| EP Series Base Mounted Clutch/Brakes | 286 |
| EP-C Series Ceramic Faced Base Mounted Clutch/Brakes | N/A |
| **EP-W Electro Pack Washdown Clutch/Brakes | N/A |

Electrically Released Brakes

Spring-Set Brakes

| | |
|---|-----|
| ERS Series Static Engaged Brakes | N/A |
| ERD Series Dual Purpose Engagement Brakes | N/A |
| UNIBRAKES AC Motor Brakes | 298 |

*Permanent Magnet Brakes

| | |
|---|-----|
| FB Series Shaft Mounted Brakes | 294 |
| ER Series Flange Mounted Brakes | 296 |

*EM

| | |
|---|-----|
| UM-FBC Series Clutch/Electrically Released Brakes | N/A |
| EM-FBB, EM-FBC, EM-MBFB Series Brake Modules | N/A |

* It is recommended that electrically released brakes such as the EM-FBB, UM-FBC and EM or EM-MBFB not be rebuilt in the field. Specific custom-fixtures are used during factory assembly that ensure proper alignment of internal components and therefore unit function. These brakes are commonly used in applications involving personnel or equipment safety and an incorrectly rebuilt brake might result in danger to personnel or damage to expensive equipment. Therefore, replacement components are not available for these products.

** It is not possible to rebuild an EP-W unit without damage to the unit coating. Damaging the coating will leave the unit prone to water damage and/or provide access for bacteria. Therefore, replacement components for these products are not available.

When replacing components in clutches and brakes several guidelines are appropriate. In all cases, when replacing worn friction surfaces both the components need to be replaced. In many cases, the splined hubs should be inspected and replaced if worn.

Common Replacement Practices:

EM/UM/EUM clutches

- Replace rotor and armature
- Inspect splined hub

EM/UM/EUM clutch/brakes

- Replace clutch rotor and armature
- Replace brake magnet and armature
- Inspect splined hub

EC clutches

- Replace clutch rotor and armature

EB brakes

- Replace magnet and armature

ATC clutches

- Replace clutch rotor facing and armature facing
- Inspect splined hub

ATB brakes

- Replace magnet facing and armature facing
- Inspect splined hub

Electro-Pack clutch/brake

- Replace clutch rotor and armature
- Replace brake magnet and armature
- Inspect splined hub

Electrically released brakes

- On all Electrically released brakes the magnet and armature are only sold as a matched set and must be replaced as a set.

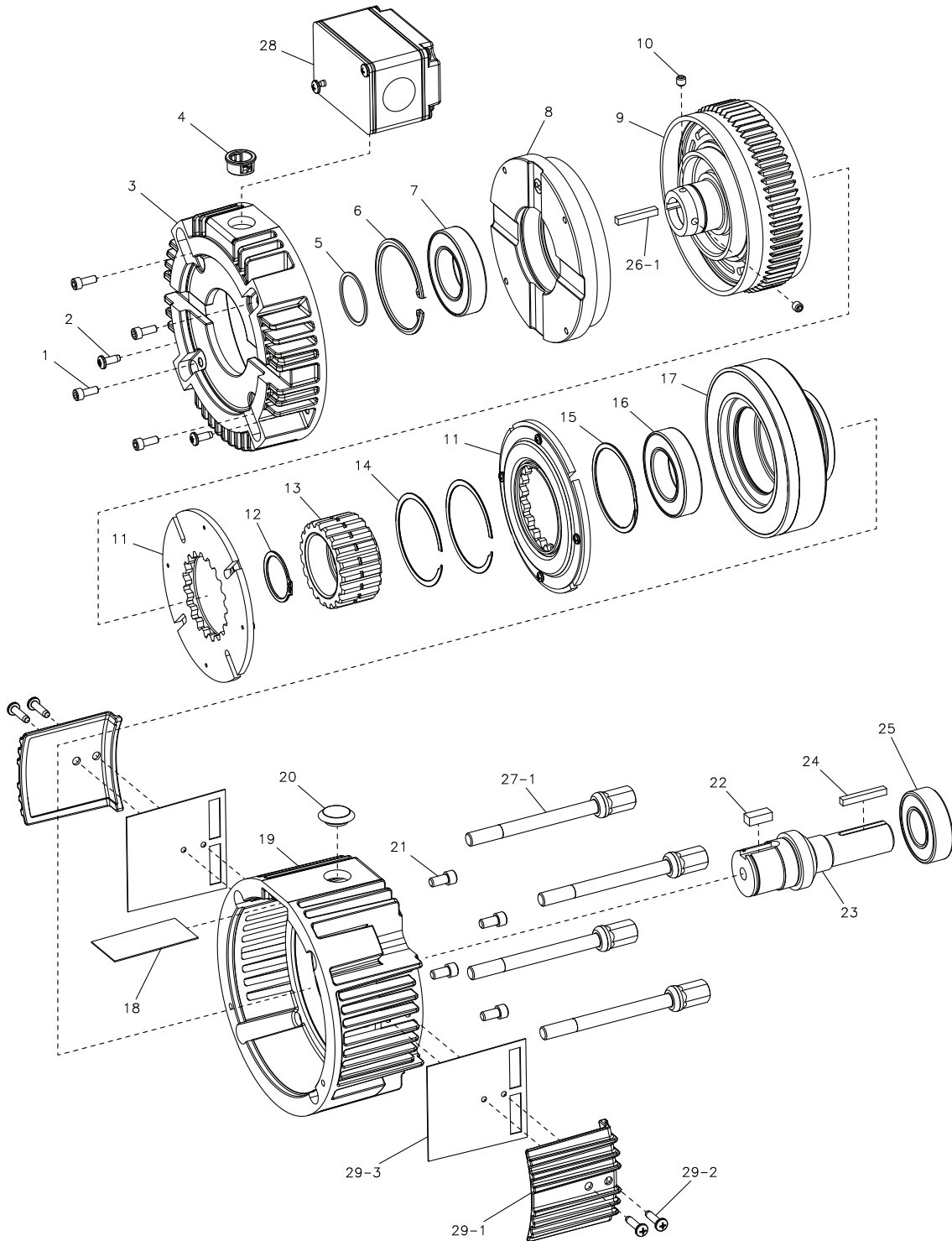
A note on burnishing:

When new friction surfaces are installed it will be necessary to burnish the unit prior to returning to full production rates. Burnishing is the act of wearing in the friction faces to ensure full engagement and therefore full torque. Burnishing is achieved by simply cycling the unit under less than full load (machine empty, if possible). Most units will achieve full torque in less than 100 cycles. Refer to the service manual for more details.

UM Series UniModule

GEN 2 Design – UM-1020 Clutch/Brake Combination

Sizes 50, 100 and 180



Service Parts

GEN 2 Design – UM-1020 Clutch/Brake Combination Sizes 50, 100 and 180

Component Parts

| Item | Description | UM-50 | | UM-100 | | UM-180 | |
|------|-----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Field Mounting Screw | 797-1214 | 4 | 797-1214 | 4 | 797-1214 | 4 |
| 2 | Screw | 797-1568 | 2 | 797-1568 | 2 | 797-1568 | 2 |
| 3 | Housing | 535-0204 | 1 | 535-0204 | 1 | 535-0204 | 1 |
| 4 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 5 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0018 | 1 |
| 6 | Retaining Ring | 748-0561 | 1 | 748-0561 | 1 | 748-0561 | 1 |
| 7 | Ball Bearing | 166-0150 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 8 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-201 | | 5370-451-206 | | 5370-451-206 | |
| | 24 Volt | 5370-451-203 | | 5370-451-208 | | 5370-451-208 | |
| | 90 Volt | 5370-451-204 | | 5370-451-209 | | 5370-451-209 | |
| 9 | Rotor Assembly | 5370-751-019 | 1 | 5370-751-049 | 1 | 5370-751-051 | 1 |
| 10 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 |
| 11 | Armature Assembly | 5370-111-022 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 |
| 12 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 13 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 14 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 15 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 16 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 17 | Magnet Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-631-201 | | 5370-631-216 | | 5370-631-216 | |
| | 24 Volt | 5370-631-203 | | 5370-631-218 | | 5370-631-218 | |
| | 90 Volt | 5370-631-204 | | 5370-631-219 | | 5370-631-219 | |
| 18 | Insulator | 572-1029 | 1 | 572-1029 | 1 | 572-1029 | 1 |
| 19 | Housing | 535-0206 | 1 | 535-0206 | 1 | 535-0206 | 1 |
| 20 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 21 | Magnet Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 22 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 23 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 24 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 25 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 26 | Mounting Accessory | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 |
| | 26-1 Key | 590-0142 | 1 | 590-0142 | 1 | 590-0142 | 1 |
| 27 | Mounting Accessory | 5370-101-075 | 1 | 5370-101-075 | 1 | 5370-101-075 | 1 |
| | 27-1 Tie Bolt | 825-0014 | 4 | 825-0014 | 4 | 825-0014 | 4 |
| 28 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 29 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 29-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 29-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 29-3 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-4.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

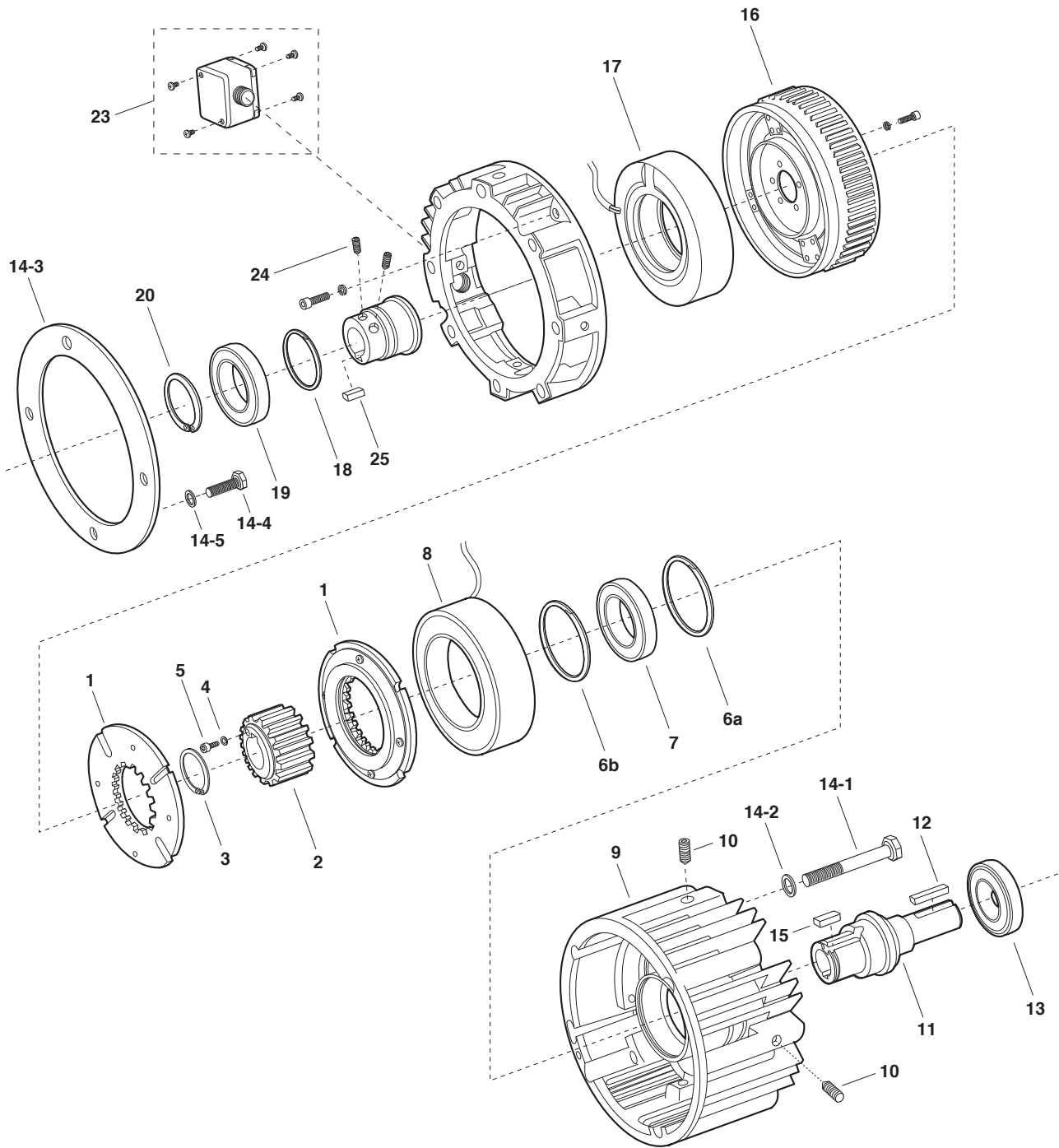


Service Parts

UM Series UniModule

Original Design – UM-1020 Clutch/Brake Combination

Sizes 50, 100, 180, 210 and 215



Service Parts

Original Design – UM-1020 Clutch/Brake Combination Sizes 50, 100, 180, 210 and 215

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | UM-50 | | UM-100 | | UM-180 | | UM-210 | | UM-215 | |
|------|-----------------------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-011 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 | 5371-111-005 | 2 | 5371-111-005 | 2 |
| 2 | Armature Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-0741 | 1 |
| 3 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 4 | Lockwasher | | | | | | | 950-0372 | 6 | 950-0372 | 6 |
| 5 | Capscrew | | | | | | | 797-0081 | 6 | 797-0081 | 6 |
| 6a | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 6b | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 8 | Magnet | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-631-008 | | 5370-631-002 | | 5370-631-002 | | 5371-631-002 | | 5371-631-002 | |
| | 24 volt | 5370-631-010 | | 5370-631-005 | | 5370-631-005 | | 5371-631-005 | | 5371-631-005 | |
| | 90 volt | 5370-631-007 | | 5370-631-003 | | 5370-631-003 | | 5371-631-003 | | 5371-631-003 | |
| 9 | Housing | 535-0165 | 1 | 535-0162 | 1 | 535-0162 | 1 | 535-0163 | 1 | 535-0163 | 1 |
| 10 | Setscrew | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 11 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 | 798-0254 | 1 |
| 12 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 13 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 14 | Mounting Accessory | 5370-101-040 | 1 | 5370-101-040 | 1 | 5370-101-040 | 1 | 5371-101-020 | 1 | 5371-101-020 | 1 |
| | 14-1 Capscrew | 797-1378 | 4 | 797-1378 | 4 | 797-1378 | 4 | 797-1440 | 4 | 797-1440 | 4 |
| | 14-2 Washer | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | 950-0111 | 4 | 950-0111 | 4 |
| | 14-3 Adapter | | | 807-0218 | 1 | | | 104-0321 | 1 | 104-0321 | 1 |
| | 14-4 Capscrew | | | | | | | 797-1442 | 4 | 797-1442 | 4 |
| | 14-5 Washer | | | | | | | 950-0101 | 4 | 950-0101 | 4 |
| 15 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| 16 | Rotor Assembly (with fan and hub) | 5370-751-019 | 1 | 5370-751-022 | 1 | 5370-751-017 | 1 | 5371-751-012 | 1 | 5371-751-031 | 1 |
| 17 | Field (with housing) | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-062 | | 5370-451-057 | | 5370-451-057 | | 5371-451-027 | | 5371-451-027 | |
| | 24 volt | 5370-451-064 | | 5370-451-059 | | 5370-451-059 | | 5371-451-029 | | 5371-451-029 | |
| | 90 volt | 5370-451-063 | | 5370-451-058 | | 5370-451-058 | | 5371-451-028 | | 5371-451-028 | |
| 18 | Retaining Ring | 748-0101 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0558 | 1 | 748-0558 | 1 |
| 19 | Bearing | 166-0150 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0168 | 1 | 166-0168 | 1 |
| 20 | Retaining Ring | 748-0018 | 1 | 748-0001 | 1 | 748-0001 | 1 | 748-0067 | 1 | 748-0067 | 1 |
| 23 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 24 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 | 797-1098 | 2 | 797-1098 | 2 |
| 25 | Input Key | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 | 5371-101-044 | 1 |

Note: As of June, 2000 all rotors are manufactured as a single piece design.
The rotor assembly part number remains the same and now includes the hub and set screws.

Refer to Service Manual P-213.
These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.

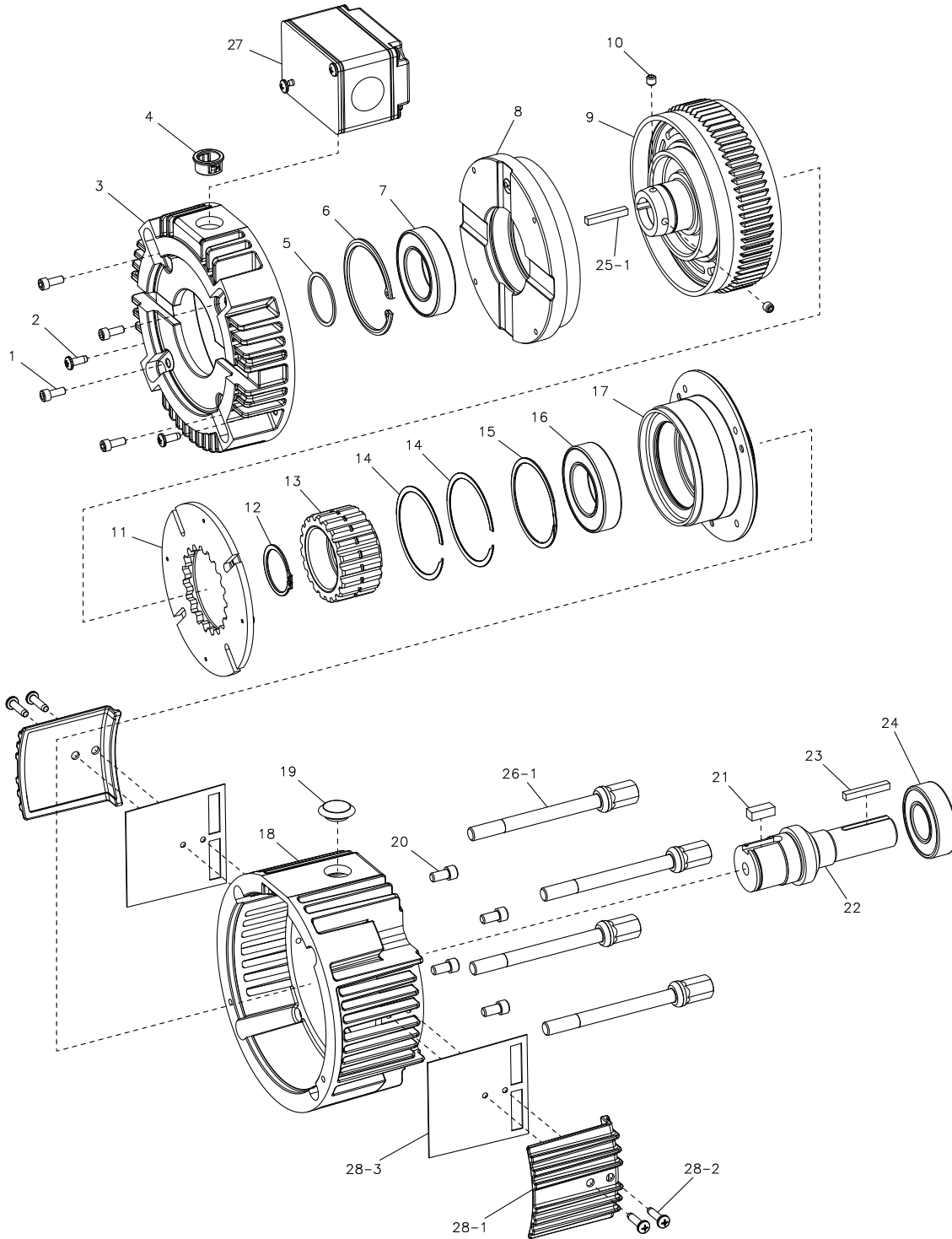


Service Parts

UM Series UniModule

GEN 2 Design – UM-1040 Clutch/Brake Combination

Sizes 50, 100 and 180



Service Parts

GEN 2 Design – UM-1040 Clutch/Brake Combination Sizes 50, 100 and 180

Component Parts

| Item | Description | UM-50 | | UM-100 | | UM-180 | |
|------|-----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Field Mounting Screw | 797-1214 | 4 | 797-1214 | 4 | 797-1214 | 4 |
| 2 | Screw | 797-1568 | 2 | 797-1568 | 2 | 797-1568 | 2 |
| 3 | Housing | 535-0204 | 1 | 535-0204 | 1 | 535-0204 | 1 |
| 4 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 5 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0018 | 1 |
| 6 | Retaining Ring | 748-0561 | 1 | 748-0561 | 1 | 748-0561 | 1 |
| 7 | Ball Bearing | 166-0150 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 8 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-201 | | 5370-451-206 | | 5370-451-206 | |
| | 24 Volt | 5370-451-203 | | 5370-451-208 | | 5370-451-208 | |
| | 90 Volt | 5370-451-204 | | 5370-451-209 | | 5370-451-209 | |
| 9 | Rotor Assembly | 5370-751-019 | 1 | 5370-751-049 | 1 | 5370-751-051 | 1 |
| 10 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 |
| 11 | Armature Assembly | 5370-111-022 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 |
| 12 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 13 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 14 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 15 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 16 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 17 | Bearing Hub | 690-0276 | 1 | 690-0278 | 1 | 690-0278 | 1 |
| 18 | Housing | 535-0207 | 1 | 535-0207 | 1 | 535-0207 | 1 |
| 19 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 20 | Hub Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 21 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 22 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 23 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 24 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 25 | Mounting Accessory | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 |
| | 25-1 Key | 590-0142 | 1 | 590-0142 | 1 | 590-0142 | 1 |
| 26 | Mounting Accessory | 5370-101-075 | 1 | 5370-101-075 | 1 | 5370-101-075 | 1 |
| | 26-1 Tie Bolt | 825-0014 | 4 | 825-0014 | 4 | 825-0014 | 4 |
| 27 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 28 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 28-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 28-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 28-3 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-4.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

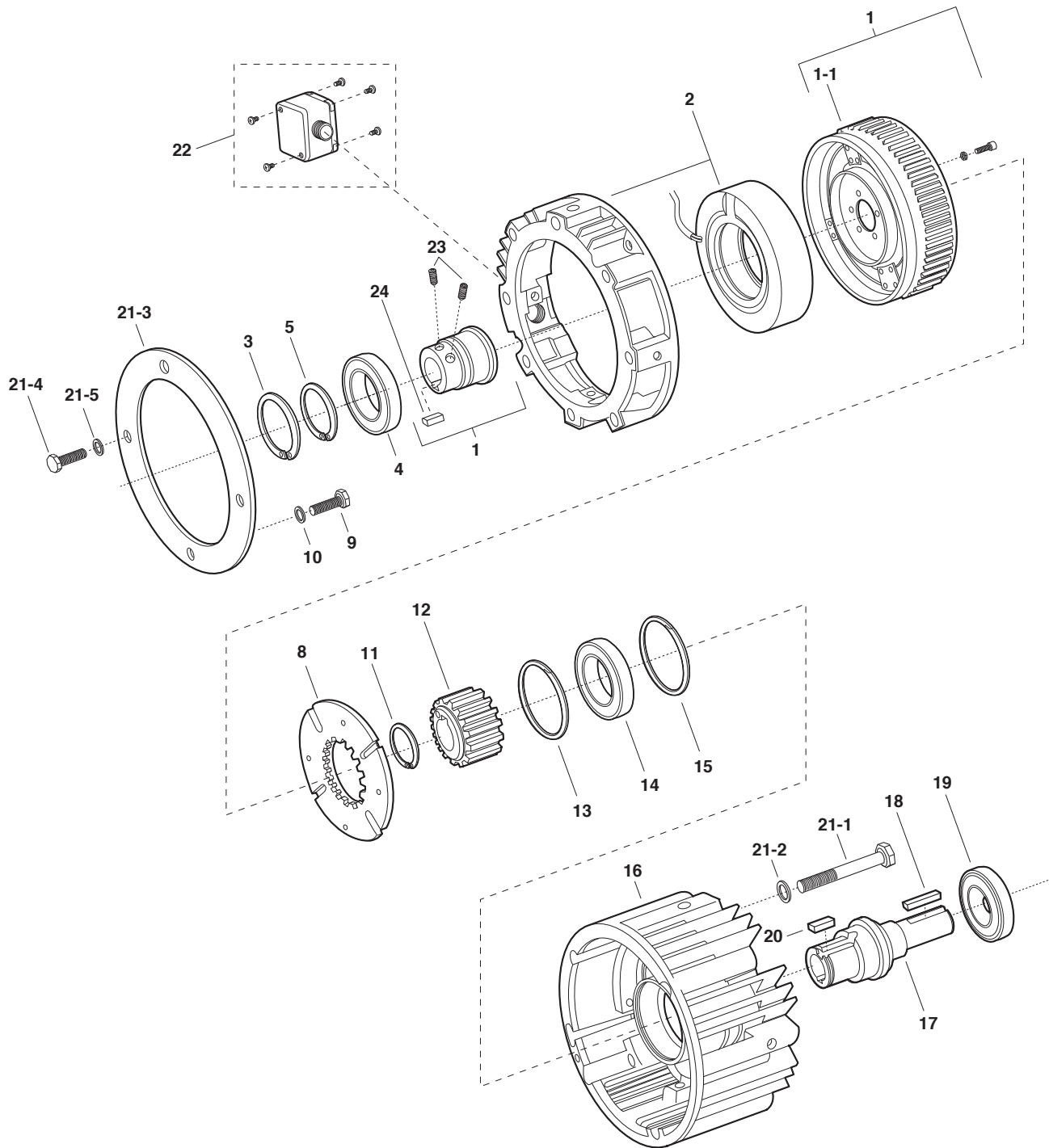


Service Parts

UM Series UniModule

Original Design – UM-1040 Clutch Combination

Sizes 50, 100, 180, 210 and 215



Service Parts

Original Design – UM-1040 Clutch Combination

Sizes 50, 100, 180, 210 and 215

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | UM-50 | | UM-100 | | UM-180 | | UM-210 | | UM-215 | |
|------|-----------------------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Rotor Assembly (with fan and hub) | 5370-751-019 | 1 | 5370-751-022 | 1 | 5370-751-017 | 1 | 5371-751-012 | 1 | 5371-751-031 | 1 |
| 2 | Field (with housing) | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-062 | | 5370-451-057 | | 5370-451-057 | | 5371-451-027 | | 5371-451-027 | |
| | 24 volt | 5370-451-064 | | 5370-451-059 | | 5370-451-059 | | 5371-451-029 | | 5371-451-029 | |
| | 90 volt | 5370-451-063 | | 5370-451-058 | | 5370-451-058 | | 5371-451-028 | | 5371-451-028 | |
| 3 | Retaining Ring | 748-0101 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0558 | 1 | 748-0558 | 1 |
| 4 | Bearing | 166-0150 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0168 | 1 | 166-0168 | 1 |
| 5 | Retaining Ring | 748-0018 | 1 | 748-0001 | 1 | 748-0001 | 1 | 748-0067 | 1 | 748-0067 | 1 |
| 8 | Armature Assembly | 5370-111-011 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 | 5371-111-005 | 1 | 5371-111-005 | 1 |
| 9 | Capscrew | | | | | | | 797-0081 | 6 | 797-0081 | 6 |
| 10 | Lockwasher | | | | | | | 950-0372 | 6 | 950-0372 | 6 |
| 11 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 12 | Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-0741 | 1 |
| 13 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 14 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 15 | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 16 | Housing | 535-0167 | 1 | 535-0168 | 1 | 535-0168 | 1 | 535-0169 | 1 | 535-0169 | 1 |
| 17 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 | 798-0254 | 1 |
| 18 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 19 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 20 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| 21 | Mounting Accessory | 5370-101-040 | 1 | 5370-101-040 | 1 | 5370-101-040 | 1 | 5371-101-020 | 1 | 5371-101-020 | 1 |
| | 21-1 Capscrew | 797-1378 | 4 | 797-1378 | 4 | 797-1378 | 4 | 797-1440 | 4 | 797-1440 | 4 |
| | 21-2 Lockwasher | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | 950-0111 | 4 | 950-0111 | 4 |
| | 21-3 Adapter | | | 807-0218 | 1 | | | 104-0321 | 1 | 104-0321 | 1 |
| | 21-4 Capscrew | | | | | | | 797-1442 | 4 | 797-1442 | 4 |
| | 21-5 Lockwasher | | | | | | | 950-0101 | 4 | 950-0101 | 4 |
| 22 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 23 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 | 797-1098 | 2 | 797-1098 | 2 |
| 24 | Input Key | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 | 5371-101-044 | 1 |

Note: As of June, 2000 all rotors are manufactured as a single piece design. The rotor assembly part number remains the same and now includes the hub and set screws.

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.

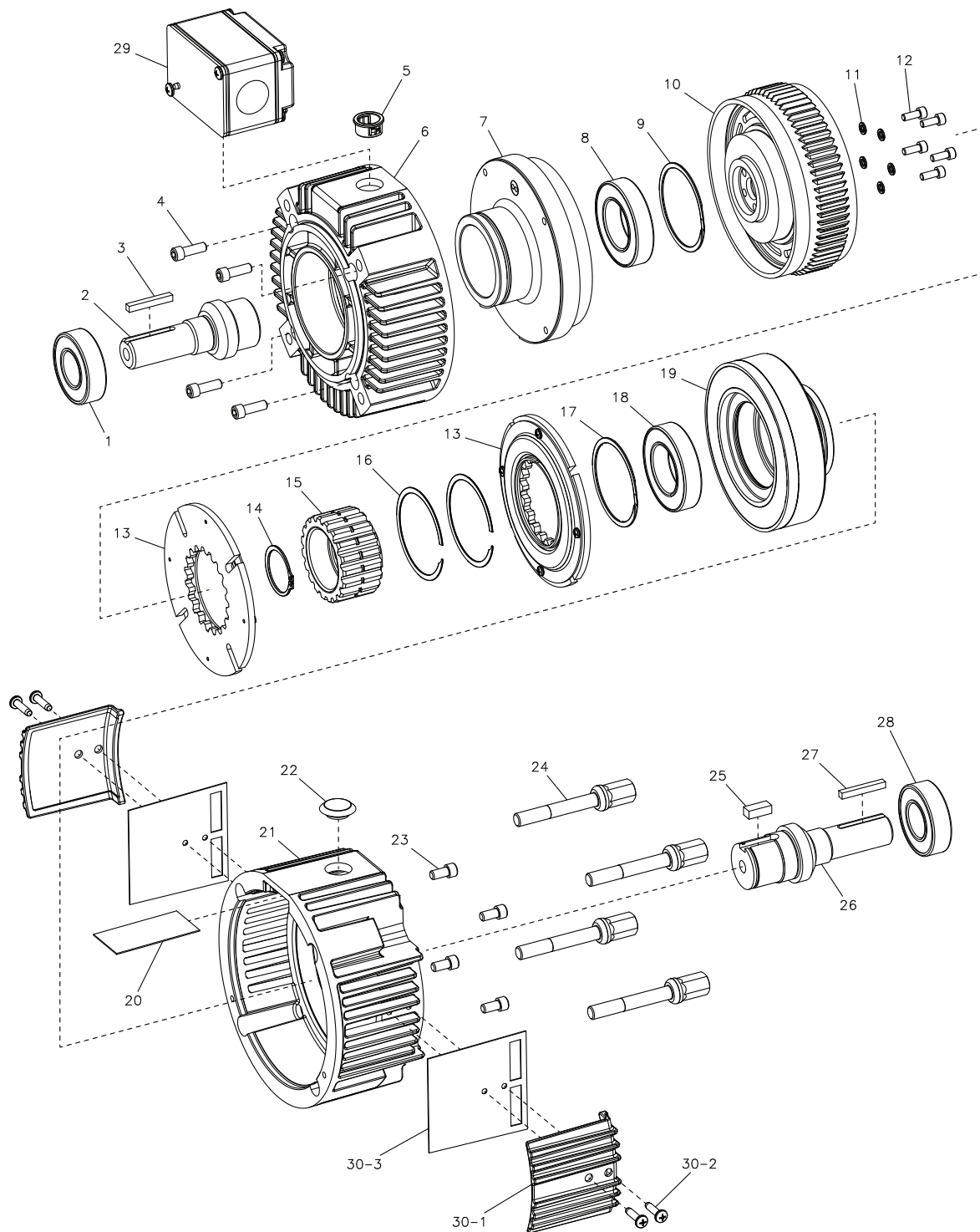


Service Parts

UM Series UniModule

GEN 2 Design – UM-2030 Clutch/Brake Combination

Sizes 50, 100 and 180



Service Parts

GEN 2 Design – UM-2030 Clutch/Brake Combination Sizes 50, 100 and 180

Component Parts

| Item | Description | UM-50 | | UM-100 | | UM-180 | |
|------|-----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 2 | Shaft | 798-0300 | 1 | 798-0303 | 1 | 798-0306 | 1 |
| 3 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 4 | Field Mounting Screw | 797-0077 | 4 | 797-0077 | 4 | 797-0077 | 4 |
| 5 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 6 | Housing | 535-0205 | 1 | 535-0205 | 1 | 535-0205 | 1 |
| 7 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-211 | | 5370-451-216 | | 5370-451-216 | |
| | 24 Volt | 5370-451-213 | | 5370-451-218 | | 5370-451-218 | |
| | 90 Volt | 5370-451-214 | | 5370-451-219 | | 5370-451-219 | |
| 8 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 9 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 10 | Rotor Assembly | 5370-751-006 | 1 | 5370-751-053 | 1 | 5370-751-053 | 1 |
| 11 | Washer | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 |
| 12 | Screw | 797-1294 | 4 | 797-1214 | 5 | 797-1214 | 5 |
| 13 | Armature Assembly | 5370-111-022 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 |
| 14 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 15 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 16 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 17 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 18 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 19 | Magnet Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-631-201 | | 5370-631-216 | | 5370-631-216 | |
| | 24 Volt | 5370-631-203 | | 5370-631-218 | | 5370-631-218 | |
| | 90 Volt | 5370-631-204 | | 5370-631-219 | | 5370-631-219 | |
| 20 | Insulator | 572-1029 | 1 | 572-1029 | 1 | 572-1029 | 1 |
| 21 | Housing | 535-0206 | 1 | 535-0206 | 1 | 535-0206 | 1 |
| 22 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 23 | Magnet Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 24 | Tie Bolt | 825-0013 | 4 | 825-0013 | 4 | 825-0013 | 4 |
| 25 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 26 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 27 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 28 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 29 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 30 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 30-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 30-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 30-3 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-4.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

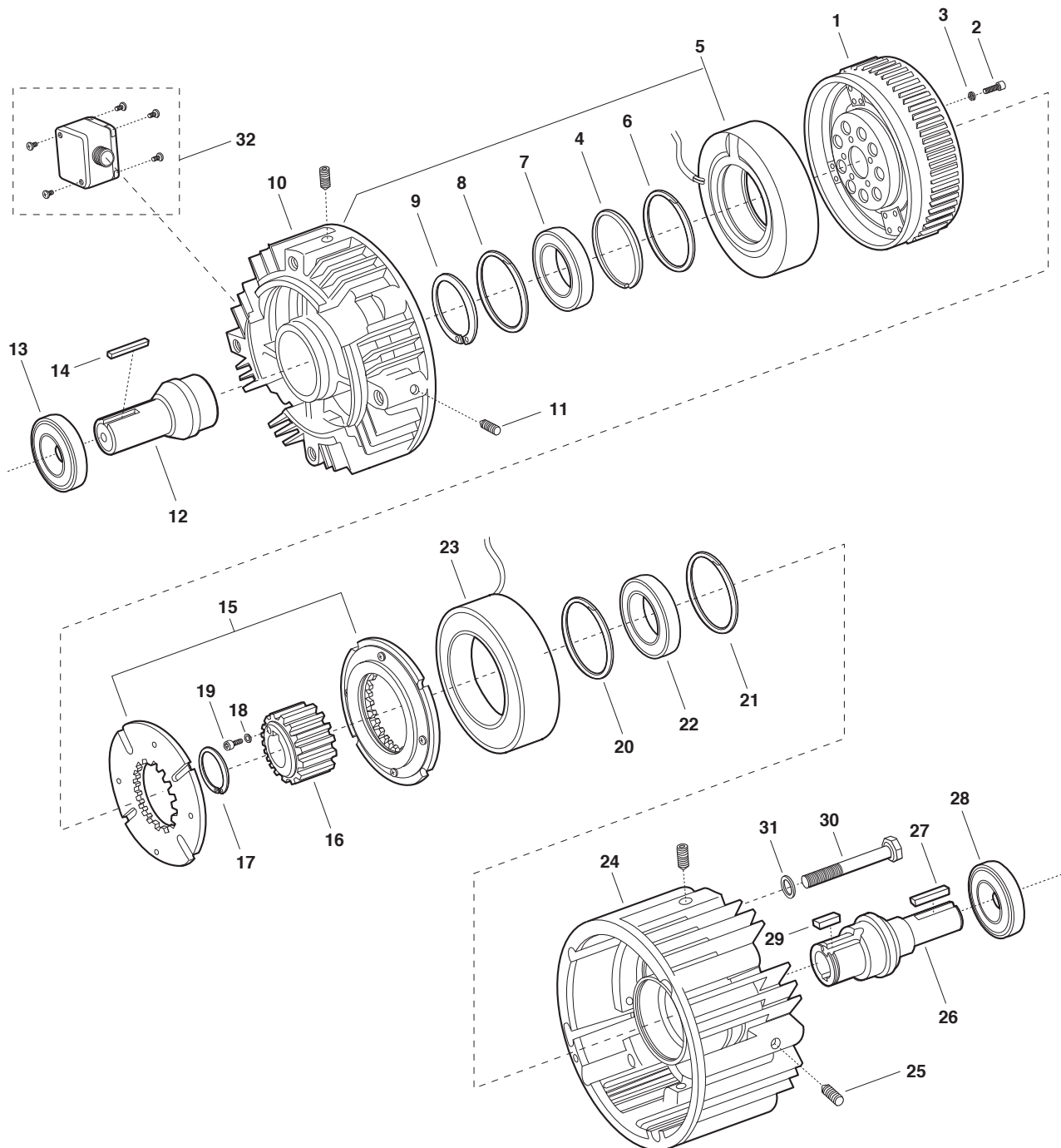


Service Parts

UM Series UniModule

Original Design – UM-2030 Clutch/Brake Combination

Sizes 50, 100, 180, 210 and 215



Service Parts

Original Design – UM-2030 Clutch/Brake Combination Sizes 50, 100, 180, 210 and 215

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | UM-50 | | UM-100 | | UM-180 | | UM-210 | | UM-215 | |
|------|--|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Rotor Assembly w/fan | 5370-751-006 | 1 | 5370-751-009 | 1 | 5370-751-009 | 1 | 5371-751-007 | 1 | 5371-751-007 | 1 |
| 2 | Capscrew | 797-1294 | 4 | 797-1214 | 5 | 797-1214 | 5 | 797-0083 | 6 | 797-0083 | 6 |
| 3 | Lockwasher | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 | 950-0372 | 6 | 950-0372 | 6 |
| 4 | Spacer | | | 807-0062 | 1 | 807-0062 | 1 | 807-0061 | 1 | 807-0061 | 1 |
| 5 | Field (with housing UM-50-2030 only) 1 | | | 1 | | 1 | | 1 | | 1 | |
| | 6 volt | 5370-451-072 | | 5370-451-007 | | 5370-451-007 | | 5371-451-002 | | 5371-451-002 | |
| | 24 volt | 5370-451-074 | | 5370-451-005 | | 5370-451-005 | | 5371-451-005 | | 5371-451-005 | |
| | 90 volt | 5370-451-073 | | 5370-451-008 | | 5370-451-008 | | 5371-451-003 | | 5371-451-003 | |
| 6 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 8 | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 9 | Retaining Ring | 748-0017 | 1 | | | | | | | | |
| 10 | Housing | | | 535-0164 | 1 | 535-0164 | 1 | 535-0129 | 1 | 535-0129 | 1 |
| 11 | Setscrew | | | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 12 | Shaft | 798-0047 | 1 | 798-0129 | 1 | 798-0124 | 1 | 798-0123 | 1 | 798-0255 | 1 |
| 13 | Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 14 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 15 | Armature Assembly | 5370-111-011 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 | 5371-111-005 | 2 | 5371-111-005 | 2 |
| 16 | Armature Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-0741 | 1 |
| 17 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 18 | Lockwasher | | | | | | | 950-0372 | 6 | 950-0372 | 6 |
| 19 | Capscrew | | | | | | | 797-0081 | 6 | 797-0081 | 6 |
| 20 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 21 | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 22 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 23 | Magnet | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-631-008 | | 5370-631-002 | | 5370-631-002 | | 5371-631-002 | | 5371-631-002 | |
| | 24 volt | 5370-631-010 | | 5370-631-005 | | 5370-631-005 | | 5371-631-005 | | 5371-631-005 | |
| | 90 volt | 5370-631-007 | | 5370-631-003 | | 5370-631-003 | | 5371-631-003 | | 5371-631-003 | |
| 24 | Housing | 535-0165 | 1 | 535-0162 | 1 | 535-0162 | 1 | 535-0163 | 1 | 535-0163 | 1 |
| 25 | Setscrew | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 26 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 | 798-0251 | 1 |
| 27 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 28 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 29 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| 30 | Capscrew | 797-0353 | 4 | 797-0353 | 4 | 797-0353 | 4 | 797-1075 | 4 | 797-1075 | 4 |
| 31 | Lockwasher | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | 950-0032 | 4 | 950-0032 | 4 |
| 32 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

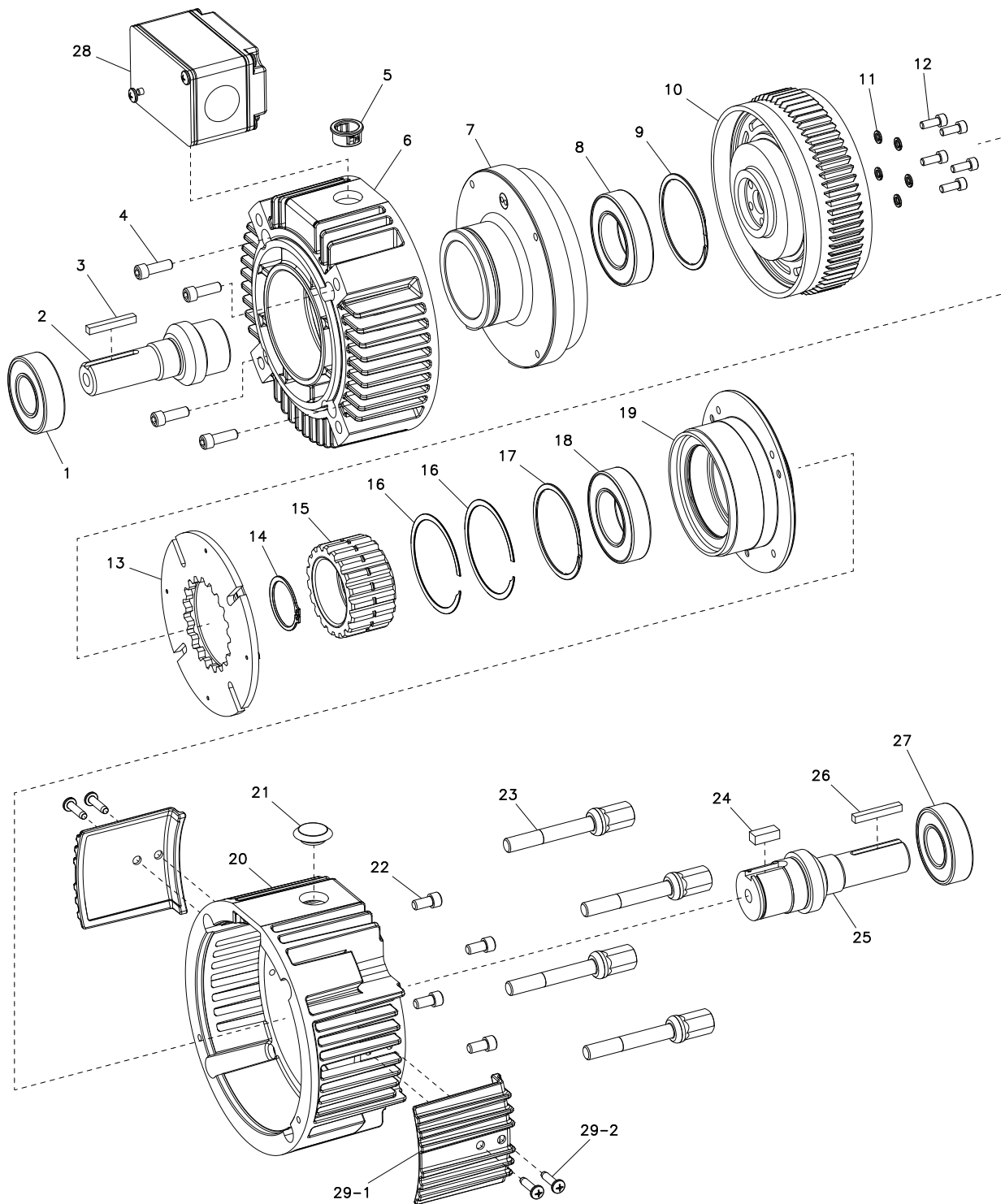


Service Parts

UM Series UniModule

GEN 2 Design – UM-3040 Clutch Combination-Base Mounted

Sizes 50, 100 and 180



Service Parts

GEN 2 Design – UM-3040 Clutch Combination-Base Mounted Sizes 50, 100 and 180

Component Parts

| Item | Description | UM-50 | | UM-100 | | UM-180 | |
|------|-----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 2 | Shaft | 798-0300 | 1 | 798-0303 | 1 | 798-0306 | 1 |
| 3 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 4 | Field Mounting Screw | 797-0077 | 4 | 797-0077 | 4 | 797-0077 | 4 |
| 5 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 6 | Housing | 535-0205 | 1 | 535-0205 | 1 | 535-0205 | 1 |
| 7 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-211 | | 5370-451-216 | | 5370-451-216 | |
| | 24 Volt | 5370-451-213 | | 5370-451-218 | | 5370-451-218 | |
| | 90 Volt | 5370-451-214 | | 5370-451-219 | | 5370-451-219 | |
| 8 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 9 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 10 | Rotor Assembly | 5370-751-006 | 1 | 5370-751-053 | 1 | 5370-751-053 | 1 |
| 11 | Washer | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 |
| 12 | Screw | 797-1294 | 4 | 797-1214 | 5 | 797-1214 | 5 |
| 13 | Armature Assembly | 5370-111-022 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 |
| 14 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 15 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 16 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 17 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 18 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 19 | Bearing Hub | 690-0276 | 1 | 690-0278 | 1 | 690-0278 | 1 |
| 20 | Housing | 535-0207 | 1 | 535-0207 | 1 | 535-0207 | 1 |
| 21 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 22 | Hub Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 23 | Tie Bolt | 825-0013 | 4 | 825-0013 | 4 | 825-0013 | 4 |
| 24 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 25 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 26 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 27 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 28 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 29 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 29-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 29-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |

Refer to service manual P-273-4.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

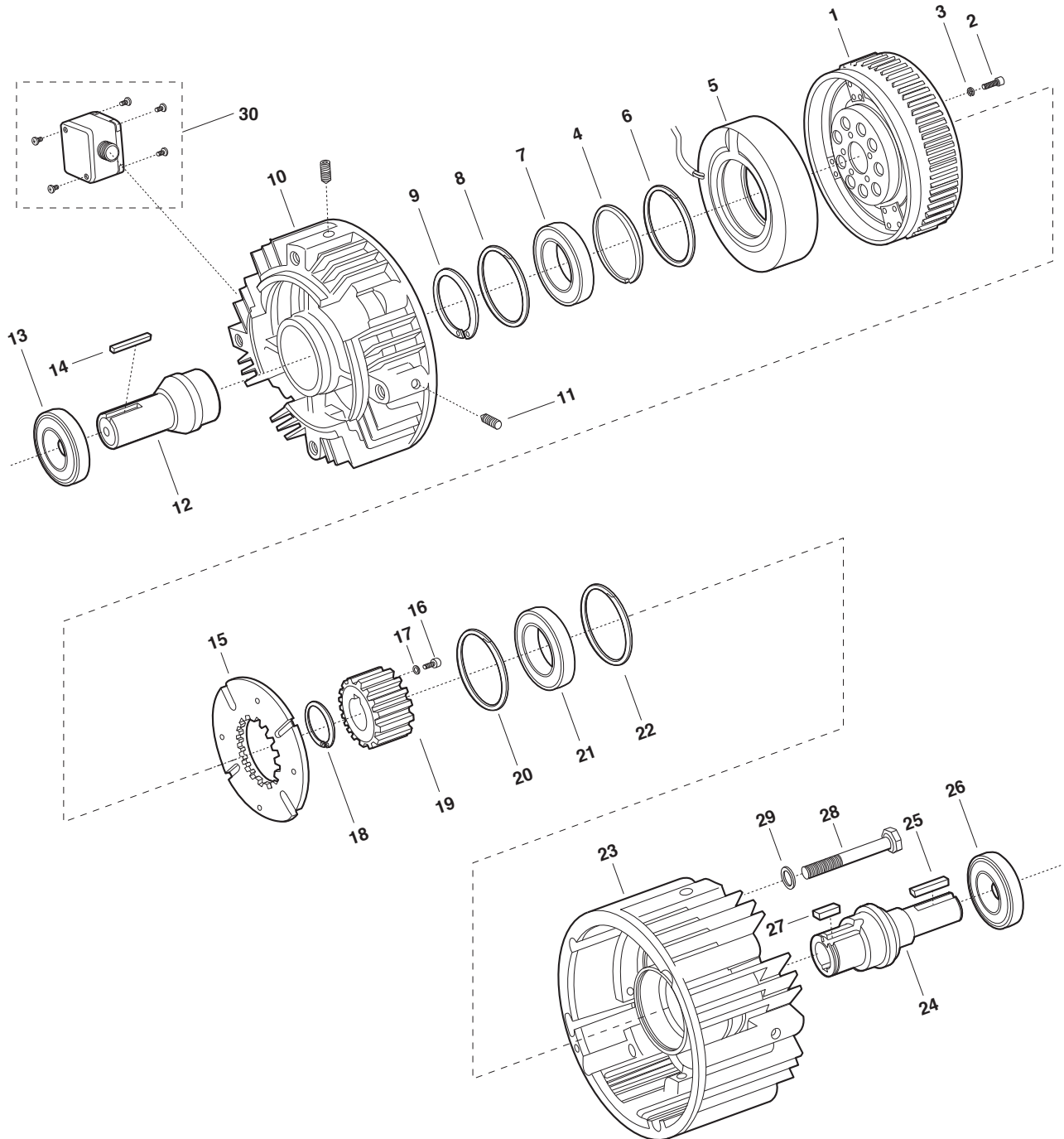


Service Parts

UM Series UniModule

Original Design – UM-3040 Clutch Combination–Base Mounted

Sizes 50, 100, 180, 210 and 215



Service Parts

Original Design – UM-3040 Clutch Combination–Base Mounted Sizes 50, 100, 180, 210 and 215

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | UM-50 | | UM-100 | | UM-180 | | UM-210 | | UM-215 | |
|------|--------------------------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Rotor Assembly w/fan | 5370-751-006 | 1 | 5370-751-009 | 1 | 5370-751-009 | 1 | 5371-751-007 | 1 | 5371-751-007 | 1 |
| 2 | Capscrew | 797-1294 | 4 | 797-1214 | 5 | 797-1214 | 5 | 797-0083 | 6 | 797-0083 | 6 |
| 3 | Lockwasher | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 | 950-0372 | 6 | 950-0372 | 6 |
| 4 | Spacer | | | 807-0062 | 1 | 807-0062 | 1 | 807-0061 | 1 | 807-0061 | 1 |
| 5 | Field (with housing UM-50-3040 only) | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-072 | | 5370-451-007 | | 5370-451-007 | | 5371-451-002 | | 5371-451-002 | |
| | 24 volt | 5370-451-074 | | 5370-451-005 | | 5370-451-005 | | 5371-451-005 | | 5371-451-005 | |
| | 90 volt | 5370-451-073 | | 5370-451-008 | | 5370-451-008 | | 5371-451-003 | | 5371-451-003 | |
| 6 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 8 | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 9 | Retaining Ring | 748-0017 | 1 | | | | | | | | |
| 10 | Housing | | | 535-0164 | 1 | 535-0164 | 4 | 535-0129 | 1 | 535-0129 | 1 |
| 11 | Setscrew | | | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 12 | Shaft | 798-0047 | 1 | 798-0129 | 1 | 798-0124 | 1 | 798-0123 | 1 | 798-0255 | 1 |
| 13 | Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 14 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 15 | Armature Assembly | 5370-111-011 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 | 5371-111-005 | 1 | 5371-111-005 | 1 |
| 16 | Capscrew | | | | | | | 797-0081 | 6 | 797-0081 | 6 |
| 17 | Lockwasher | | | | | | | 950-0372 | 6 | 950-0372 | 6 |
| 18 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 19 | Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-0741 | 1 |
| 20 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 21 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 22 | Retaining Ring | 748-0113 | 1 | | | | | | | | |
| 23 | Housing | 535-0167 | 1 | 535-0168 | 1 | 535-0168 | 1 | 535-0169 | 1 | 535-0169 | 1 |
| 24 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 | 798-0251 | 1 |
| 25 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 26 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 27 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| 28 | Capscrew | 797-0353 | 4 | 797-0353 | 4 | 797-0353 | 4 | 797-1075 | 4 | 797-1075 | 4 |
| 29 | Lockwasher | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | 950-0032 | 4 | 950-0032 | 4 |
| 30 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

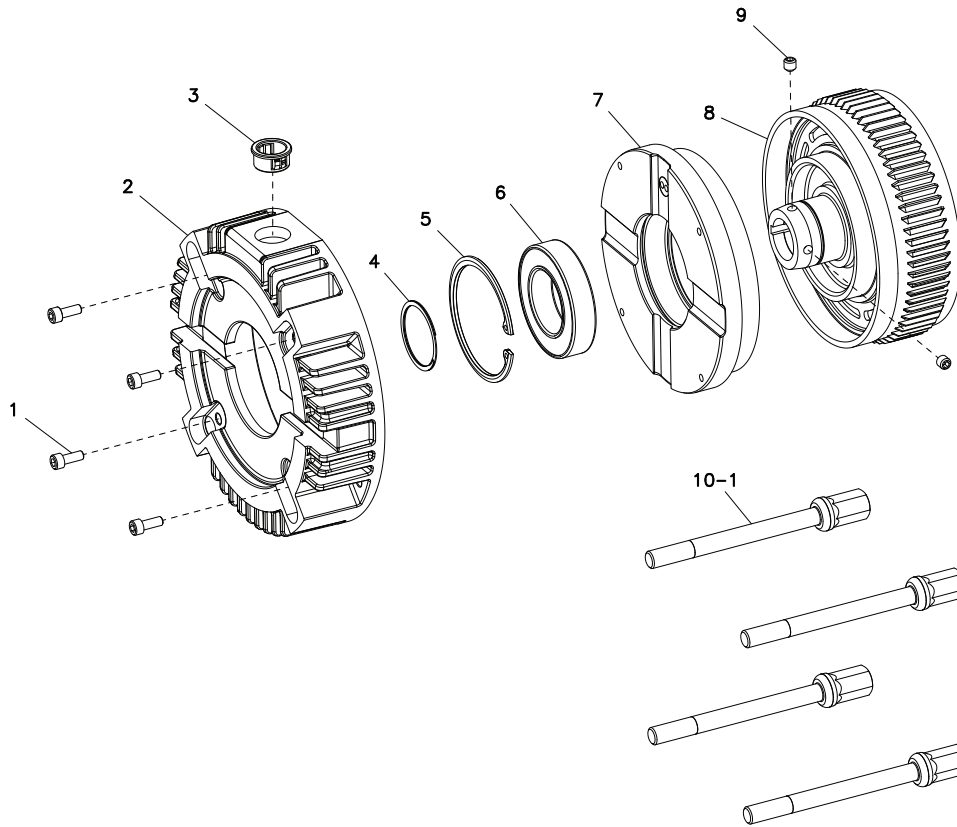


Service Parts

EM Series Electro Module

GEN 2 Design – EM-10 Motor Clutch Module

Sizes 50, 100 and 180



Component Parts

| Item | Description | EM-50 | | EM-100 | | EM-180 | |
|------|----------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Field Mounting Screw | 797-1214 | 4 | 797-1214 | 4 | 797-1214 | 4 |
| 2 | Housing | 535-0204 | 1 | 535-0204 | 1 | 535-0204 | 1 |
| 3 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 4 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0018 | 1 |
| 5 | Retaining Ring | 748-0561 | 1 | 748-0561 | 1 | 748-0561 | 1 |
| 6 | Bearing | 166-0150 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 7 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-201 | | 5370-451-206 | | 5370-451-206 | |
| | 24 Volt | 5370-451-203 | | 5370-451-208 | | 5370-451-208 | |
| | 90 Volt | 5370-451-204 | | 5370-451-209 | | 5370-451-209 | |
| 8 | Rotor Assembly | 5370-751-019 | 1 | 5370-751-049 | 1 | 5370-751-051 | 1 |
| 9 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 |
| 10 | Mounting Accessory | 5370-101-075 | 1 | 5370-101-075 | 1 | 5370-101-075 | 1 |
| | 10-1 Tie Bolt | 825-0014 | 4 | 825-0014 | 4 | 825-0014 | 4 |

Refer to Service Manual P-273-5.
These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

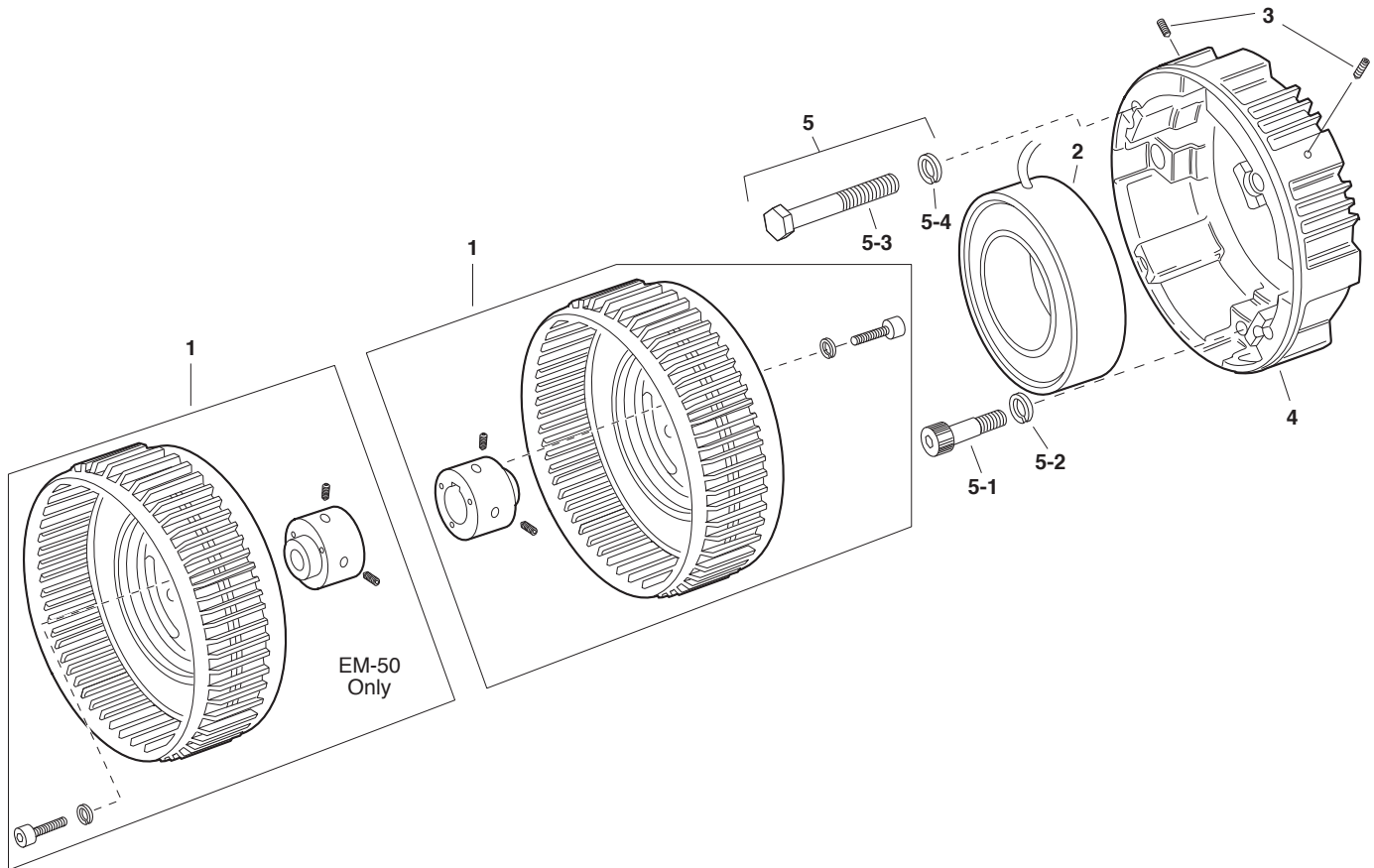


Service Parts

EM Series Electro Module

Original Design – EM-10 Motor Clutch Module

Sizes 50, 100, 180 and 210



Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | EM-50 | | EM-100 | | EM-180 | | EM-210 | |
|------|----------------------------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1* | Rotor Assembly w/fan & hub | 5370-751-010 | 1 | 5370-751-013 | 1 | 5370-751-007 | 1 | 5371-751-005 | 1 |
| | Field | | 1 | | 1 | | 1 | | 1 |
| 2 | 6 volt | 5370-451-011 | | 5370-451-021 | | 5370-451-021 | | 5371-451-010 | |
| | 24 volt | 5370-451-014 | | 5370-451-024 | | 5370-451-024 | | 5371-451-013 | |
| | 90 volt | 5370-451-012 | | 5370-451-022 | | 5370-451-022 | | 5371-451-011 | |
| 3 | Setscrew | | | | | | | 797-0471 | 4 |
| 4 | Adapter | | | | | | | 104-0096 | 1 |
| 5 | Mounting Accessory | 5370-101-028 | 1 | 5370-101-013 | 1 | 5370-101-013 | 1 | 5371-101-008 | 1 |
| | 5-1 Capscrew | 797-0293 | 4 | 797-0293 | 4 | 797-0293 | 4 | 797-1078 | 4 |
| | 5-2 Lockwasher | 950-0128 | 4 | 950-0128 | 4 | 950-0128 | 4 | 950-0101 | 4 |
| | 5-3 Capscrew | | | | | | | 797-1075 | 4 |
| | 5-4 Lockwasher | | | | | | | 950-0032 | 4 |

*Shipped Assembled
Refer to Service Manual P-213.
These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

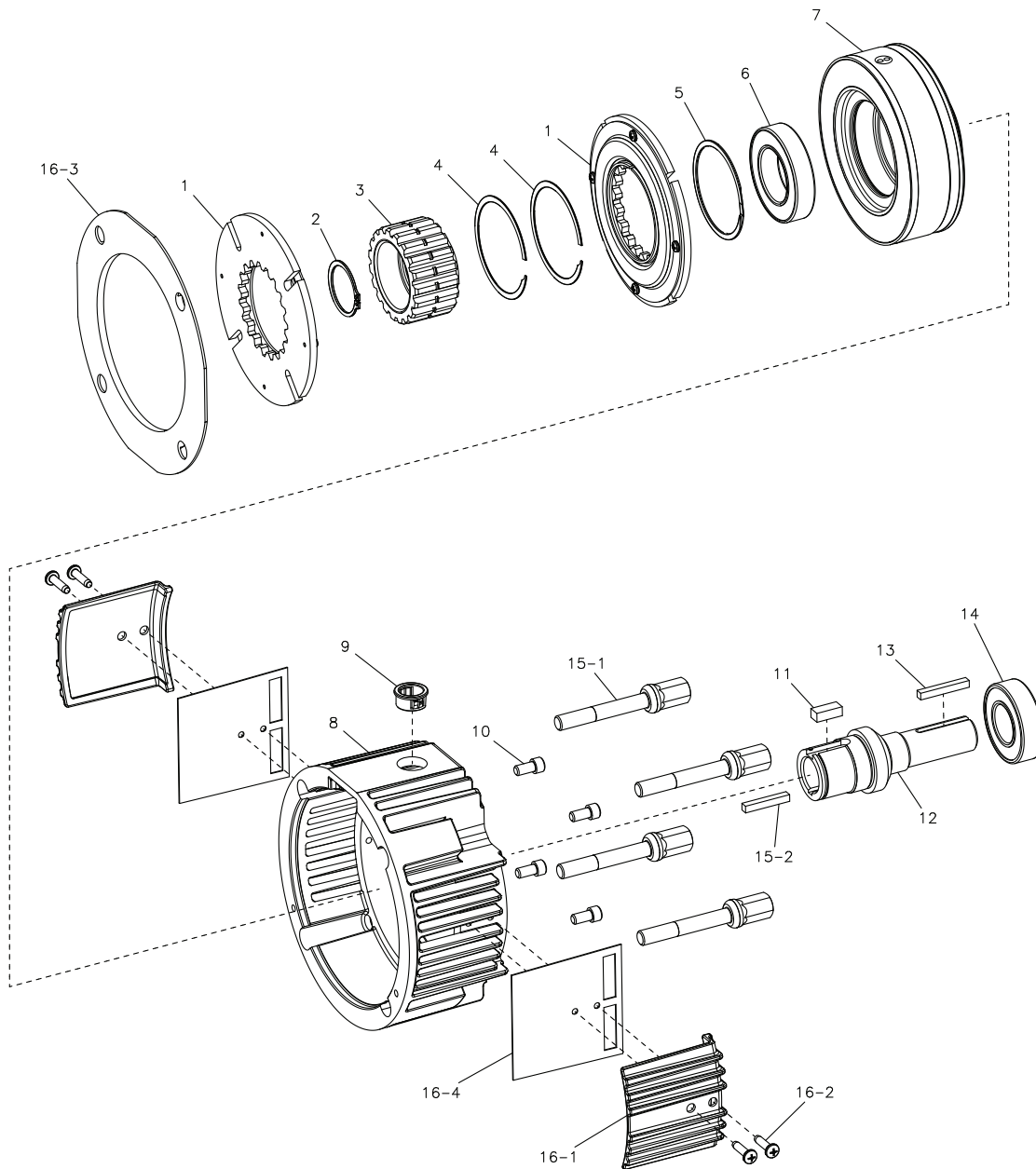


Service Parts

EM Series Electro Module

GEN 2 Design – EM-20 Brake Module

Sizes 50, 100 and 180



Service Parts

EM Series Electro Module

GEN 2 Design – EM-20 Brake Module

Sizes 50, 100 and 180

Component Parts

| Item | Description | EM-50 | | EM-100 | | EM-180 | |
|------|--|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-022 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 |
| 2 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 3 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 4 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 5 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 6 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 7 | Magnet Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-631-201 | | 5370-631-216 | | 5370-631-216 | |
| | 24 Volt | 5370-631-203 | | 5370-631-218 | | 5370-631-218 | |
| | 90 Volt | 5370-631-204 | | 5370-631-219 | | 5370-631-219 | |
| 8 | Housing | 535-0206 | 1 | 535-0206 | 1 | 535-0206 | 1 |
| 9 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 10 | Magnet Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 11 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 12 | Shaft | 798-0299 | 1 | 798-0302 | 1 | 798-0305 | 1 |
| 13 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 14 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 15 | Mounting Accessory | 5370-101-077 | 1 | 5370-101-077 | 1 | 5370-101-077 | 1 |
| | 15-1 Tie Bolt | 825-0013 | 4 | 825-0013 | 4 | 825-0013 | 4 |
| | 15-2 Key | 590-0142 | 1 | 590-0142 | 1 | 590-0142 | 1 |
| 16a | Cover Kit (Optional, for brake only) | 5370-101-082 | 1 | 5370-101-082 | 1 | 5370-101-082 | 1 |
| | 16-1 Vent Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 16-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 16-3 Cover Plate | 287-0135 | 1 | 287-0135 | 1 | 287-0135 | 1 |
| | 16-4 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |
| 16b | Cover Kit (Optional, for clutch/brake combination) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 16-1 Vent Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 16-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 16-4 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-5.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

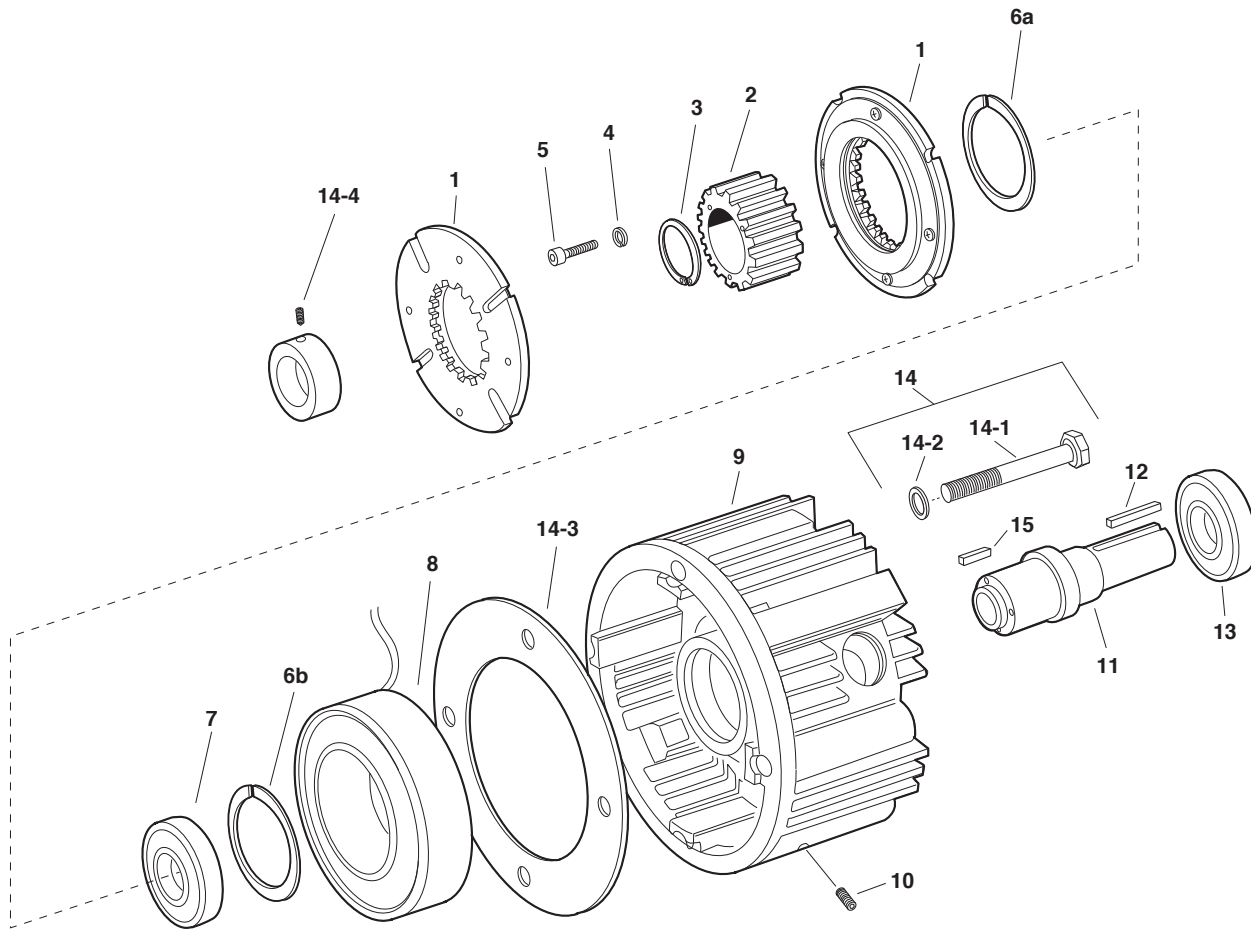


Service Parts

EM Series Electro Module

Original Design – EM-20 Brake Module

Sizes 50, 100, 180, 210 and 215



Service Parts

EM Series Electro Module

Original Design – EM-20 Brake Module Sizes 50, 100, 180, 210 and 215

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | EM-50 | | EM-100 | | EM-180 | | EM-210 | | EM-215 | |
|------|-----------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature | 5370-111-011 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 | 5371-111-005 | 2 | 5371-111-005 | 1 |
| 2 | Armature Hub | 540-1638 | 1 | 540-1684 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-2039 | 1 |
| 3 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 4 | Lockwasher | | | | | | | 950-0372 | 6 | 950-0372 | 6 |
| 5 | Capscrew | | | | | | | 797-0081 | 6 | 797-008 | 6 |
| 6a | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 6b | Retaining Ring | 748-0113 | 1 | | | | | | | 748-2002 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 8 | Magnet | | 1 | | 1 | | 1 | | 1 | | |
| | 6 Volt | 5370-631-008 | | 5370-631-002 | | 5370-631-002 | | 5371-631-002 | | | |
| | 24 Volt | 5370-631-010 | | 5370-631-005 | | 5370-631-005 | | 5371-631-005 | | | |
| | 90 Volt | 5370-631-007 | | 5370-631-003 | | 5370-631-003 | | 5371-631-003 | | 5371-631-003 | 1 |
| 9 | Housing | 535-0130 | 1 | 535-0132 | 1 | 535-0132 | 1 | 535-0033 | 1 | 535-0033 | 1 |
| 10 | Setscrew | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 11 | Shaft | 798-0045 | 1 | 798-0127 | 1 | 798-0086 | 1 | 798-0050 | 1 | 798-0268 | 1 |
| 12 | Key - Output | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 13 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 14 | Mounting Accessory | 5370-101-017 | 1 | 5370-101-017 | 1 | 5370-101-023 | 1 | 5371-101-007 | 1 | 5371-101-007 | 1 |
| | 14-1 Capscrew | 797-0353 | 4 | 797-0353 | 4 | 797-0353 | 4 | 797-1081 | 4 | 797-1081 | 4 |
| | 14-2 Washer | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | 950-0033 | 4 | 950-0033 | 4 |
| | 14-3 Spacer | | | | | 807-0218 | 1 | | | | |
| | 14-4 Collar | | | | | 266-0002 | 1 | 266-0003 | 1 | 266-0003 | 1 |
| 15 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| | Key Accessory - Input | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 | 5371-101-044 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

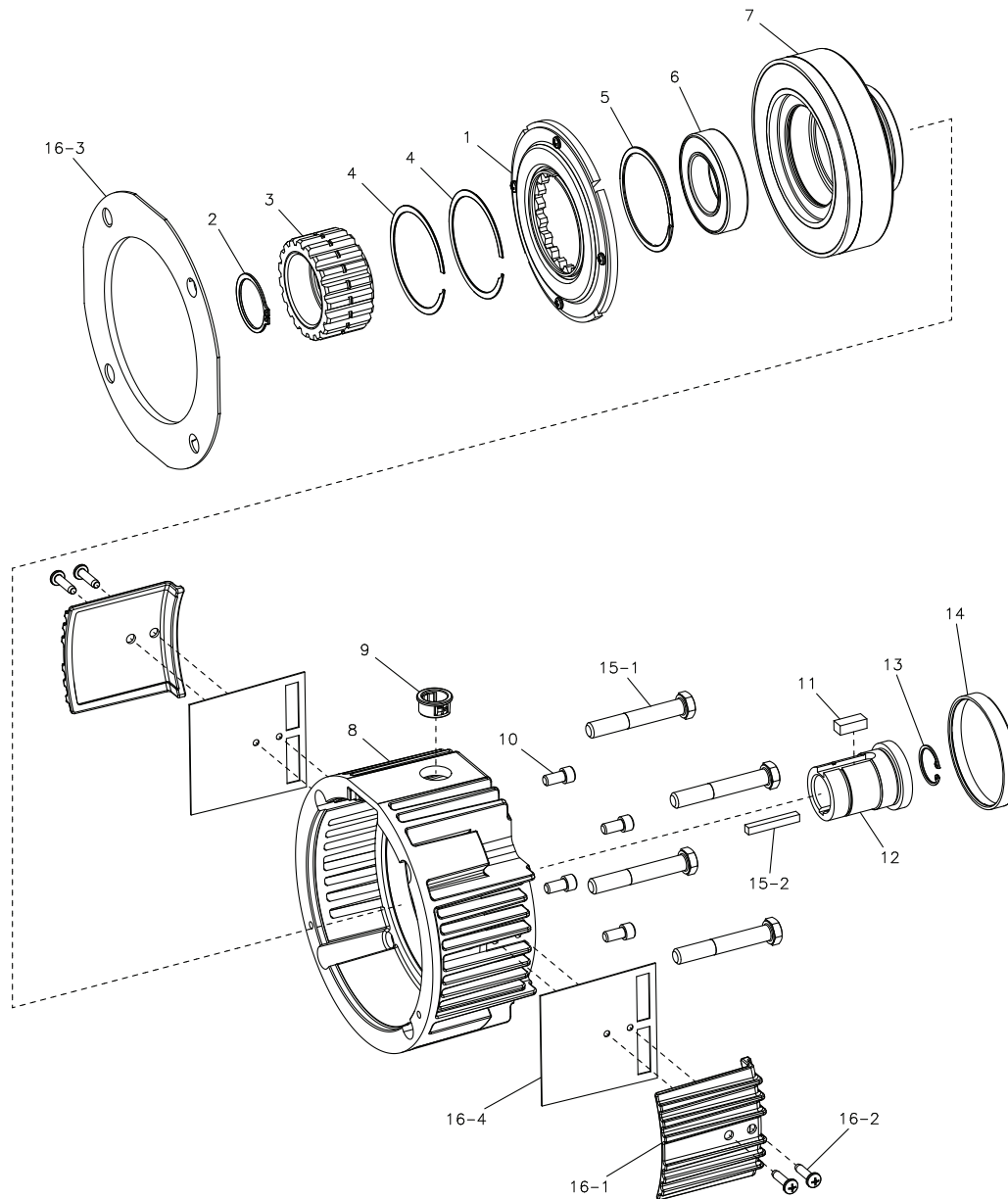


Service Parts

EM Series Electro Module

GEN 2 Design – EM-20MB Motor Brake Module

Sizes 50 and 180



Service Parts

GEN 2 Design – EM-20MB Motor Brake Module Sizes 50 and 180

Component Parts

| Item | Description | EM-50 | | EM-180 | |
|------|-----------------------------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-022 | 1 | 5370-111-013 | 1 |
| 2 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 |
| 3 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 |
| 4 | Armature Hub Retaining Ring | | | 748-0450 | 2 |
| 5 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 |
| 6 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 |
| 7 | Magnet Assembly | | 1 | | 1 |
| | 6 Volt | 5370-631-201 | | 5370-631-216 | |
| | 24 Volt | 5370-631-203 | | 5370-631-218 | |
| | 90 Volt | 5370-631-204 | | 5370-631-219 | |
| 8 | Housing | 535-0206 | 1 | 535-0206 | 1 |
| 9 | Bushing | 572-0522 | 1 | 572-0522 | 1 |
| 10 | Magnet Mounting Screw | 797-0077 | 4 | 797-1358 | 4 |
| 11 | Key | 590-0043 | 1 | 590-0084 | 1 |
| 12 | Hub | 540-2076 | 1 | 540-2078 | 1 |
| 13 | Retaining Ring | 748-0556 | 1 | 748-0555 | 1 |
| 14 | Cap | 248-1004 | 1 | 248-1004 | 1 |
| 15 | Mounting Accessory | 5370-101-081 | 1 | 5370-101-081 | 1 |
| | 15-1 Tie Bolt | 797-1563 | 4 | 797-1563 | 4 |
| | 15-2 Key | 590-0029 | 1 | 590-0029 | 1 |
| 16 | Cover Kit (Optional) | 5370-101-082 | 1 | 5370-101-082 | 1 |
| | 16-1 Vent Cover | 258-1227 | 2 | 258-1227 | 2 |
| | 16-2 Screw | 797-1562 | 4 | 797-1562 | 4 |
| | 16-3 Cover Plate | 287-0135 | 1 | 287-0135 | 1 |
| | 16-4 Gasket | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-5.

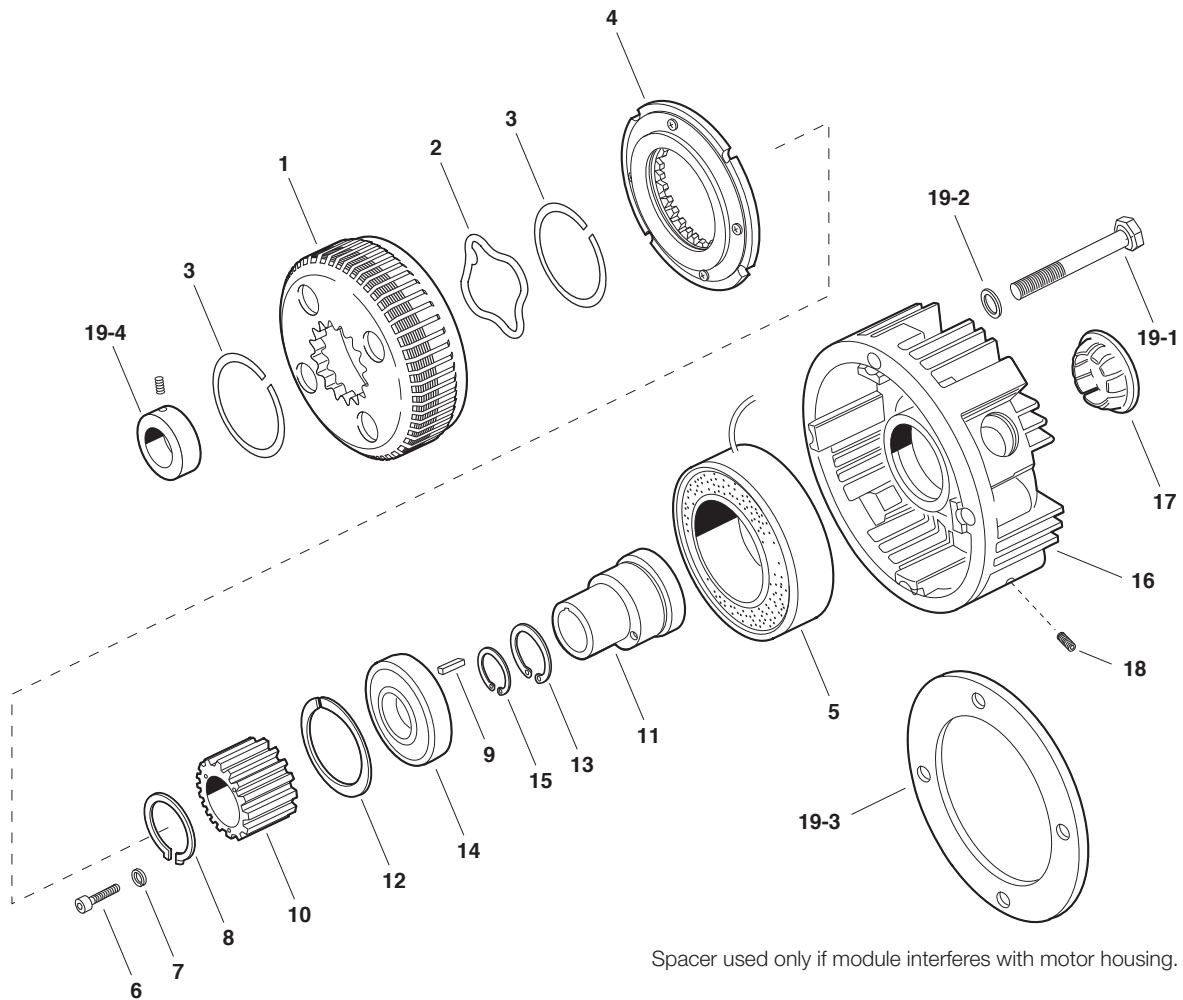
These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.



EM Series Electro Module

Original Design – 20MB Motor Brake Module

Sizes 50, 180 and 210



Service Parts

EM Series Electro Module

Original Design – 20MB Motor Brake Module

Sizes 50, 180 and 210

Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | EM-50 | | EM-180 | | EM-210 | |
|------|-----------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Fan Assembly | 5370-104-002 | 1 | 5370-104-001 | 1 | 748-1052 | 1 |
| 2 | Follow-up Spring | 808-0104 | 1 | 808-0107 | 1 | 808-0109 | 1 |
| 3 | Retaining Ring | 748-0440 | 2 | 748-0450 | 2 | 748-0455 | 2 |
| 4 | Armature | 5370-111-011 | 1 | 5370-111-013 | 1 | 5371-111-005 | 1 |
| 5 | Magnet | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-631-008 | | 5370-631-002 | | 5371-631-002 | |
| | 24 Volt | 5370-631-010 | | 5370-631-005 | | 5371-631-005 | |
| | 90 Volt | 5370-631-007 | | 5370-631-003 | | 5371-631-003 | |
| 6 | Capscrew | | | | | 797-0081 | 6 |
| 7 | Lockwasher | | | | | 950-0372 | 6 |
| 8 | Retaining Ring | 748-0445 | 1 | | | | |
| 9 | Key | 590-0043 | 1 | 590-0084 | 1 | | |
| 10 | Splined Hub | 540-1646 | 1 | 540-1647 | 1 | 540-2041 | 1 |
| 11 | Hub | 540-1018 | 1 | 540-0726 | 1 | 540-1020 | 1 |
| 12 | Retaining Ring | 748-0113 | 2 | 748-0101 | 1 | 748-0112 | 1 |
| 13 | Retaining Ring | | | 748-0676 | 1 | | |
| 14 | Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 15 | Retaining Ring | 748-0556 | 1 | 748-0555 | 1 | 748-0554 | 1 |
| 16 | Housing | 535-0136 | 1 | 535-0134 | 1 | 535-0050 | 1 |
| 17 | Plug | 680-0028 | 1 | 680-0028 | 1 | 680-0027 | 1 |
| 18 | Setscrew | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 19 | Mounting Accessory | 5370-101-017 | 1 | 5370-101-023 | 1 | 5371-101-007 | 1 |
| | 19-1 Capscrew | 797-0353 | 4 | 797-0353 | 4 | 797-1081 | 4 |
| | 19-2 Lockwasher | 950-0354 | 4 | 950-0354 | 4 | 950-0033 | 4 |
| | 19-3 Spacer | | | 807-0218 | 1 | | |
| | 19-4 Collar | | | 266-0002 | 1 | 266-0003 | 1 |
| | Key Accessory - Input | 5370-101-073 | 1 | 5370-101-073 | 1 | 5371-101-043 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

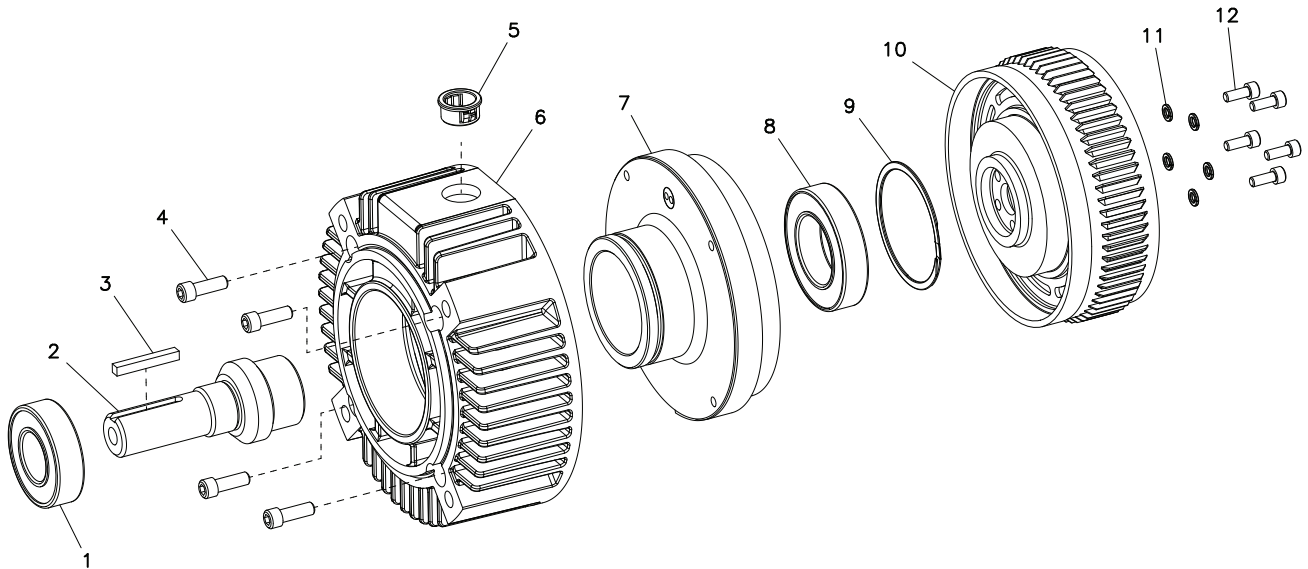


Service Parts

EM Series Electro Module

GEN 2 Design – 30 Motor Clutch Module

Sizes 50, 100 and 180



Component Parts

| Item | Description | EM-50 | | EM-100 | | EM-180 | |
|------|----------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 2 | Shaft | 798-0300 | 1 | 798-0303 | 1 | 798-0306 | 1 |
| 3 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 4 | Field Mounting Screw | 797-0077 | 4 | 797-0077 | 4 | 797-0077 | 4 |
| 5 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 6 | Housing | 535-0205 | 1 | 535-0205 | 1 | 535-0205 | 1 |
| 7 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 Volt | 5370-451-211 | | 5370-451-216 | | 5370-451-216 | |
| | 24 Volt | 5370-451-213 | | 5370-451-218 | | 5370-451-218 | |
| | 90 Volt | 5370-451-214 | | 5370-451-219 | | 5370-451-219 | |
| 8 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 9 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 10 | Rotor Assembly | 5370-751-006 | 1 | 5370-751-053 | 1 | 5370-751-053 | 1 |
| 11 | Washer | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 |
| 12 | Screw | 797-1294 | 4 | 797-1214 | 5 | 797-1214 | 5 |

Refer to service manual P-273-5.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

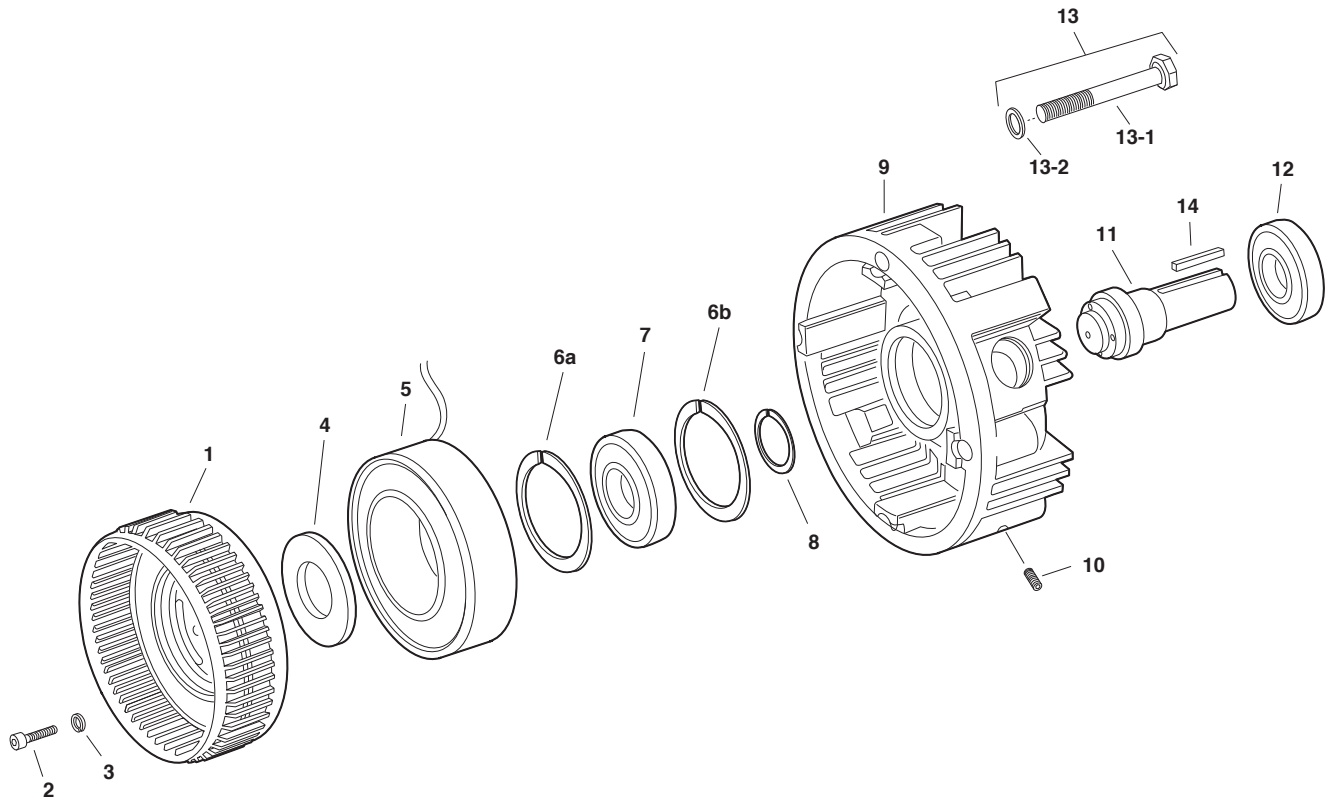


Service Parts

EM Series Electro Module

Original Design – 30 Motor Clutch Module

Sizes 50, 100, 180 and 210



Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | EM-50 | | EM-100 | | EM-180 | | EM-210 | |
|------|------------------------------------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Rotor Assembly w/fan | 5370-751-006 | 1 | 5370-751-009 | 1 | 5370-751-009 | 1 | 5371-751-007 | 1 |
| 2 | Capscrew | 797-1039 | 4 | 797-1214 | 5 | 797-1214 | 5 | 797-0083 | 6 |
| 3 | Lockwasher | 950-0436 | 4 | 950-0436 | 5 | 950-0436 | 5 | 950-0372 | 6 |
| 4 | Spacer | | | 807-0062 | 1 | 807-0062 | 1 | 807-0061 | 1 |
| 5 | Field (with housing EM-50-30 only) | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-072 | | 5370-451-007 | | 5370-451-007 | | 5371-451-002 | |
| | 24 volt | 5370-451-074 | | 5370-451-005 | | 5370-451-005 | | 5371-451-005 | |
| | 90 volt | 5370-451-073 | | 5370-451-008 | | 5370-451-008 | | 5371-451-003 | |
| 6a | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 |
| 6b | Retaining Ring | 748-0113 | 1 | | | | | | |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 8 | Retaining Ring | 748-0017 | 1 | | | | | | |
| 9 | Housing | | | 535-0164 | 1 | 535-0164 | 1 | 535-0129 | 1 |
| 10 | Setscrew | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 11 | Shaft | 798-0047 | 1 | 798-0129 | 1 | 798-0124 | 1 | 798-0123 | 1 |
| 12 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 |
| 13 | Mounting Accessory | | | | | | | 5371-101-010 | 1 |
| | 13-1 Capscrew | | | | | | | 797-1075 | 4 |
| | 13-2 Lockwasher | | | | | | | 950-0032 | 4 |
| 14 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

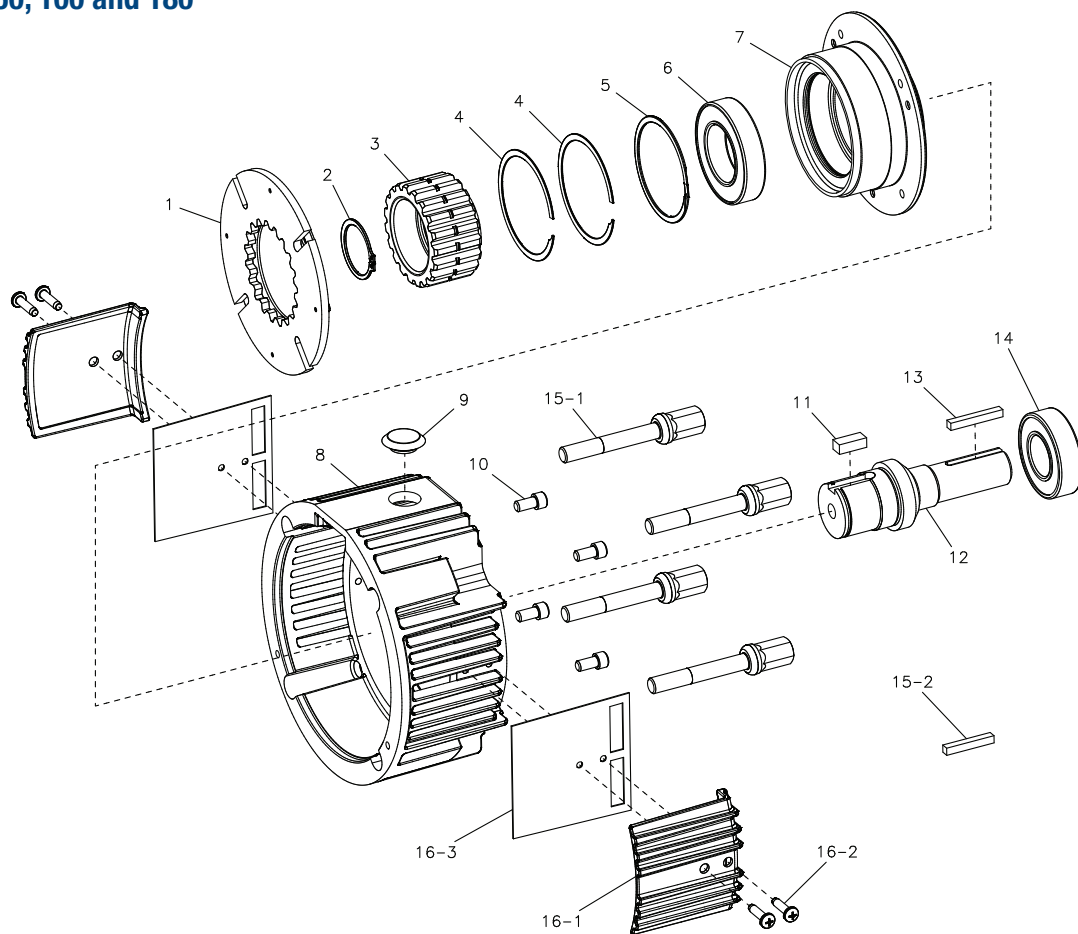


Service Parts

EM Series Electro Module

GEN 2 Design – 40 Output Clutch Module

Sizes 50, 100 and 180



Component Parts

| Item | Description | EM-50 | | EM-100 | | EM-180 | |
|------|-----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-022 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 |
| 2 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 3 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 4 | Armature Hub Retaining Ring | | | 748-0450 | 2 | 748-0450 | 2 |
| 5 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 6 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 7 | Bearing Hub | 690-0276 | 1 | 690-0278 | 1 | 690-0278 | 1 |
| 8 | Housing | 535-0207 | 1 | 535-0207 | 1 | 535-0207 | 1 |
| 9 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 10 | Hub Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 11 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 12 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 13 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 14 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 15 | Mounting Accessory | 5370-101-077 | 1 | 5370-101-077 | 1 | 5370-101-077 | 1 |
| | 15-1 Tie Bolt | 825-0013 | 4 | 825-0013 | 4 | 825-0013 | 4 |
| | 15-2 Key | 590-0142 | 1 | 590-0142 | 1 | 590-0142 | 1 |
| 16 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 16-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 16-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 16-3 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to service manual P-273-5.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

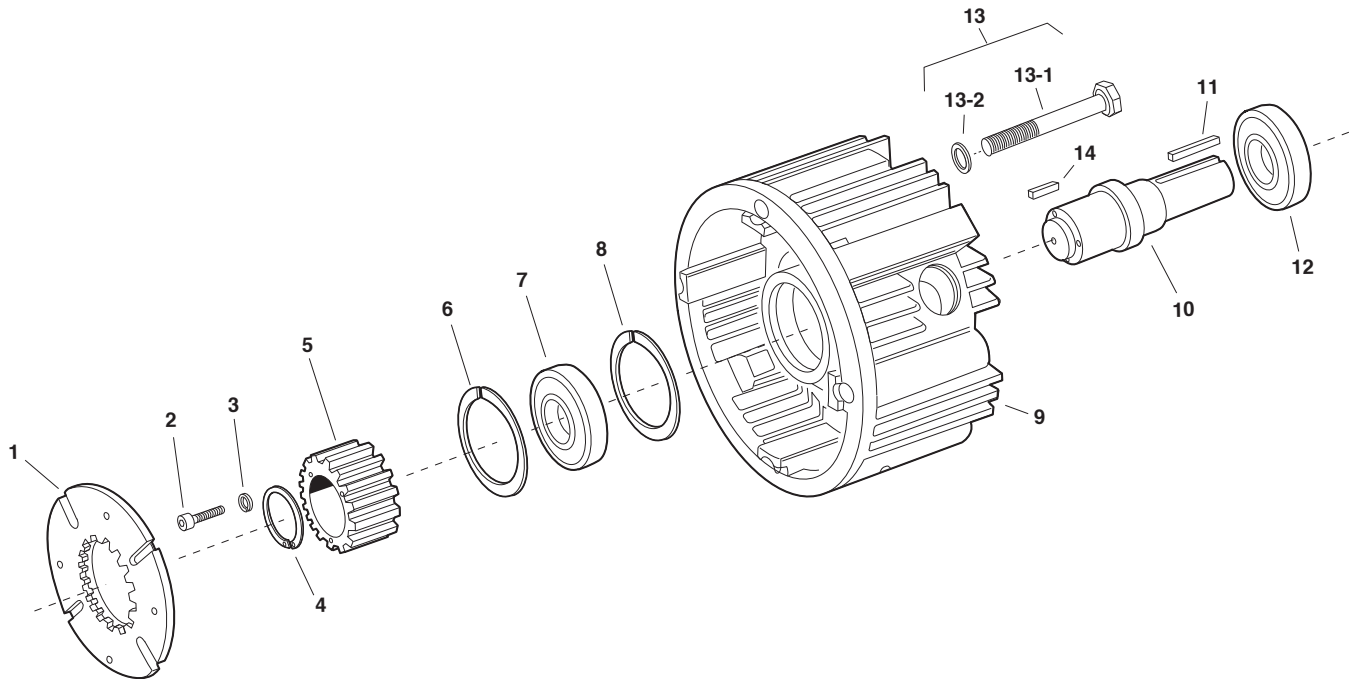


Service Parts

EM Series Electro Module

Original Design – 40 Output Clutch Module

Sizes 50, 100, 180 and 210



Component Parts (Gray shaded areas indicate original design parts which will be available for a limited time)

| Item | Description | EM-50 | | EM-100 | | EM-180 | | EM-210 | |
|------|-----------------------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature | 5370-111-011 | 1 | 5370-111-013 | 1 | 5370-111-013 | 1 | 5371-111-005 | 1 |
| 2 | Capscrew | | | | | | | 797-0081 | 1 |
| 3 | Lockwasher | | | | | | | 950-0372 | 6 |
| 4 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | |
| 5 | Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 |
| 6 | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 8 | Retaining Ring | 748-0113 | 2 | | | | | | |
| 9 | Housing | 535-0131 | 1 | 535-0133 | 1 | 535-0133 | 1 | 535-0034 | 1 |
| 10 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 |
| 11 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 |
| 12 | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 |
| 13 | Mounting Accessory | 5370-101-017 | 1 | 5370-101-017 | 1 | 5370-101-017 | 1 | | |
| | 13-1 Capscrew | 797-0353 | 4 | 797-0353 | 4 | 797-0353 | 4 | | |
| | 13-2 Lockwasher | 950-0354 | 4 | 950-0354 | 4 | 950-0354 | 4 | | |
| 14 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | |
| | Key Accessory - Input | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR2, file #59164.

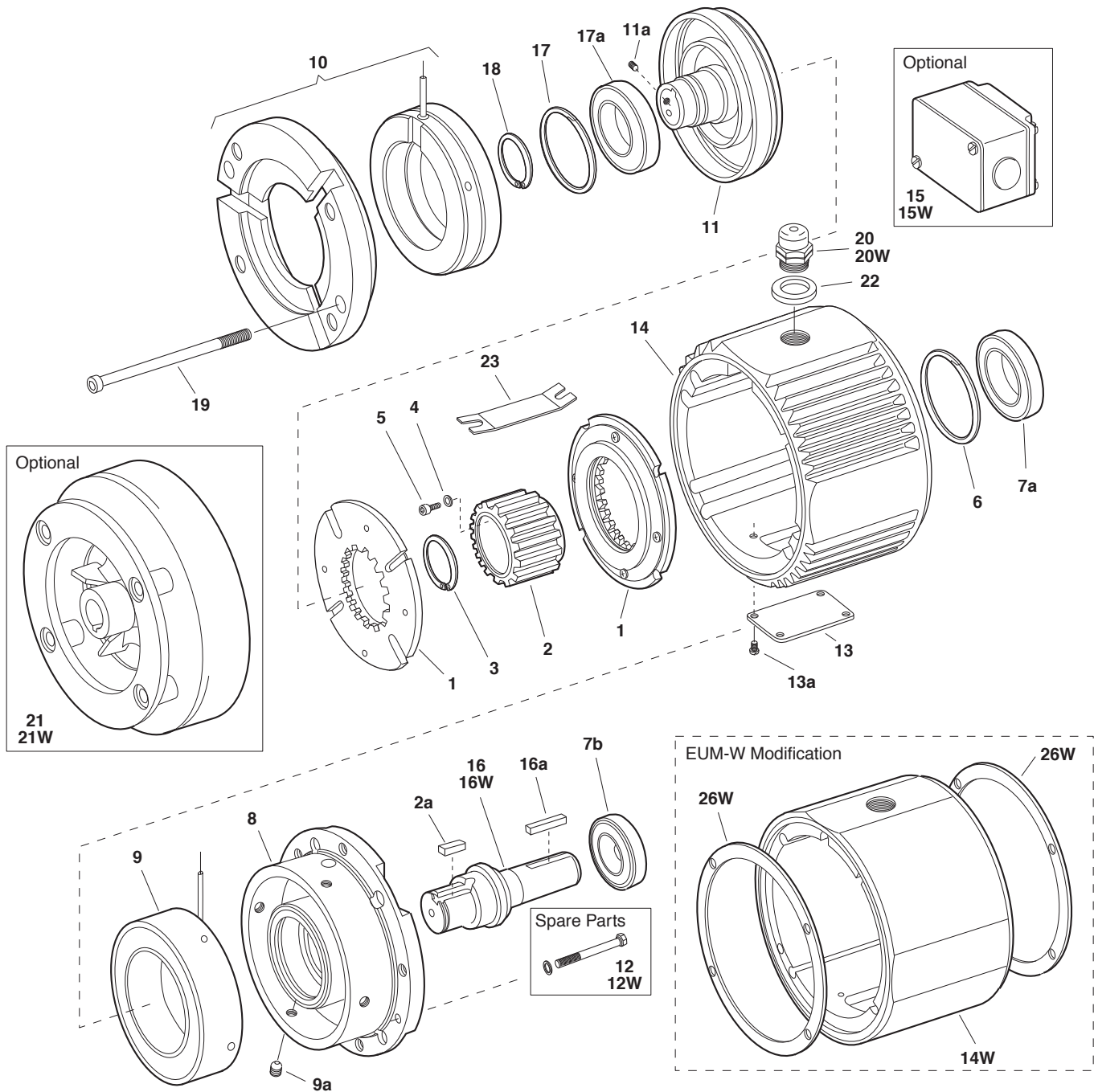


Service Parts

EUM/EUM-W Series Electro Module

EUM-1020 Clutch/Brake Combination

EUM-W-1020 Clutch/Brake Combination



Service Parts

EUM/EUM-W Series Electro Module

EUM-1020 Clutch/Brake Combination EUM-W-1020 Clutch/Brake Combination

Component Parts

| Item | Description | EUM-50 | | EUM-100 | | EUM-180 | | EUM-210 | | EUM-215 | |
|---------------------------|-------------------------------|--------------|------|--------------|------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-011 | 2 | 5370-111-013 | 2 | 5370-111-013 | 2 | 5371-111-005 | 2 | 5371-111-005 | 2 |
| 2 | Armature Hub | 540-1638 | 1 | 540-1642 | 1 | 540-1642 | 1 | 540-0741 | 1 | 540-0741 | 1 |
| 2a | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 | | | | |
| 3 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 | | | | |
| 4 | Lockwasher | | | | | | | 950-0121 | 6 | 950-0121 | 6 |
| 5 | Capscrew | | | | | | | 797-0081 | 6 | 797-0081 | 6 |
| 6 | Retaining Ring | 748-0113 | 2 | 748-0101 | 1 | 748-0101 | 1 | 748-0112 | 1 | 748-0112 | 1 |
| 7a | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0101 | 1 | 166-0142 | 1 | 166-0142 | 1 |
| 7b | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0143 | 1 | 166-0144 | 1 | 166-0144 | 1 |
| 8 | Endbell/Brake | 456-1014 | 1 | 456-1019 | 1 | 456-1019 | 1 | 456-1017 | 1 | 456-1017 | 1 |
| 9 | Brake Magnet | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-631-037 | | 5370-631-002 | | 5370-631-002 | | 5371-631-002 | | 5371-631-002 | |
| | 24 volt | 5370-631-038 | | 5370-631-005 | | 5370-631-005 | | 5371-631-005 | | 5371-631-005 | |
| | 90 volt | 5370-631-036 | | 5370-631-003 | | 5370-631-003 | | 5371-631-003 | | 5371-631-003 | |
| 9a | Set Screws | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 4 |
| 10 | Clutch Field/Endbell Assembly | | 1 | | 1 | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-077 | | 5370-451-086 | | 5370-451-086 | | 5371-451-033 | | 5371-451-033 | |
| | 24 volt | 5370-451-078 | | 5370-451-087 | | 5370-451-087 | | 5371-451-034 | | 5371-451-034 | |
| | 90 volt | 5370-451-076 | | 5370-451-085 | | 5370-451-085 | | 5371-451-032 | | 5371-451-032 | |
| 11 | Rotor/Hub Assembly | 5370-751-023 | 1 | 5370-751-035 | 1 | 5370-751-024 | 1 | 5371-751-014 | 1 | 5371-751-033 | 1 |
| 11a | Set Screws | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 | 797-1098 | 2 | 797-1098 | 2 |
| 12 | Mounting Accessory Kit | 5370-101-040 | 1 | 5370-101-040 | 1 | 5370-101-040 | 1 | 5371-101-024 | 1 | 5371-101-024 | 1 |
| 13 | Cover Plate | 686-1055 | 1 | 686-1055 | 1 | 686-1055 | 1 | 686-1055 | 1 | 686-1055 | 1 |
| 13a | Cover Plate Screws | 797-0575 | 4 | 797-0575 | 4 | 797-0575 | 4 | 797-0575 | 4 | 797-0575 | 4 |
| 14 | Center Housing | 535-0176 | 1 | 535-0176 | 1 | 535-0176 | 1 | 535-0177 | 1 | 535-0177 | 1 |
| 15 | Conduit Box (optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 16 | Shaft | 798-0046 | 1 | 798-0128 | 1 | 798-0085 | 1 | 798-0051 | 1 | 798-0254 | 1 |
| 16a | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 | 590-0124 | 1 |
| 17 | Retaining Ring | 748-0101 | 2 | 748-0101 | 1 | 748-0101 | 1 | 748-0558 | 1 | 748-0558 | 1 |
| 17a | Ball Bearing | 166-0150 | 1 | 166-0300 | 1 | 166-0300 | 1 | 166-0168 | 1 | 166-0168 | 1 |
| 18 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0018 | 1 | 748-0067 | 1 | 748-0067 | 1 |
| 19 | Assembly Bolts | 797-1433 | 2 | 797-1433 | 2 | 797-1433 | 2 | 797-1438 | 2 | 797-1438 | 2 |
| 20 | Connector | 280-0038 | 1 | 280-0038 | 1 | 280-0038 | 1 | 280-0038 | 1 | 280-0038 | 1 |
| 21 | Accessory Fan (optional) | 5370-101-055 | 1 | 5370-101-055 | 1 | 5370-101-054 | 1 | 5371-101-029 | 1 | N/A | |
| 22 | Washer | 950-0441 | 1 | 950-0441 | 1 | 950-0441 | 1 | 950-0441 | 1 | 950-0441 | 1 |
| 23 | Insulator | 572-0327 | 1 | 572-0327 | 1 | 572-0327 | 1 | 572-0327 | 1 | 572-0327 | 1 |
| EUM-W Unique Parts | | | | | | | | | | | |
| 12W | Washdown Mounting Kit | 5370-101-052 | 1 | 5370-101-052 | 1 | 5370-101-052 | 1 | 5371-101-028 | 1 | 5371-101-028 | 1 |
| 14W | Center Housing for Washdown | 535-0181 | 1 | 535-0181 | 1 | 535-0181 | 1 | 535-0182 | 1 | 535-0182 | 1 |
| 15W | Conduit Box Kit | 5370-101-045 | 1 | 5370-101-045 | 1 | 5370-101-045 | 1 | 5370-101-045 | 1 | 5370-101-045 | 1 |
| 16W | Shaft | 798-0263 | 1 | 798-0265 | 1 | 798-0262 | 1 | 798-0259 | 1 | 798-0267 | 1 |
| 20W | Conduit Connector | 280-0058 | 1 | 280-0058 | 1 | 280-0058 | 1 | 280-0058 | 1 | 280-0058 | 1 |
| 21W | Fan Kit (optional) | 5370-101-060 | 1 | 5370-101-060 | 1 | 5370-101-061 | 1 | 5371-101-033 | 1 | N/A | |
| 26W | Gasket/Seal Repair Kit | 5370-101-058 | 1 | 5370-101-058 | 1 | 5370-101-058 | 1 | 5371-101-032 | 1 | 5371-101-032 | 1 |
| | Key | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 | 5371-101-044 | 1 |

Refer to Service Manual P-213.

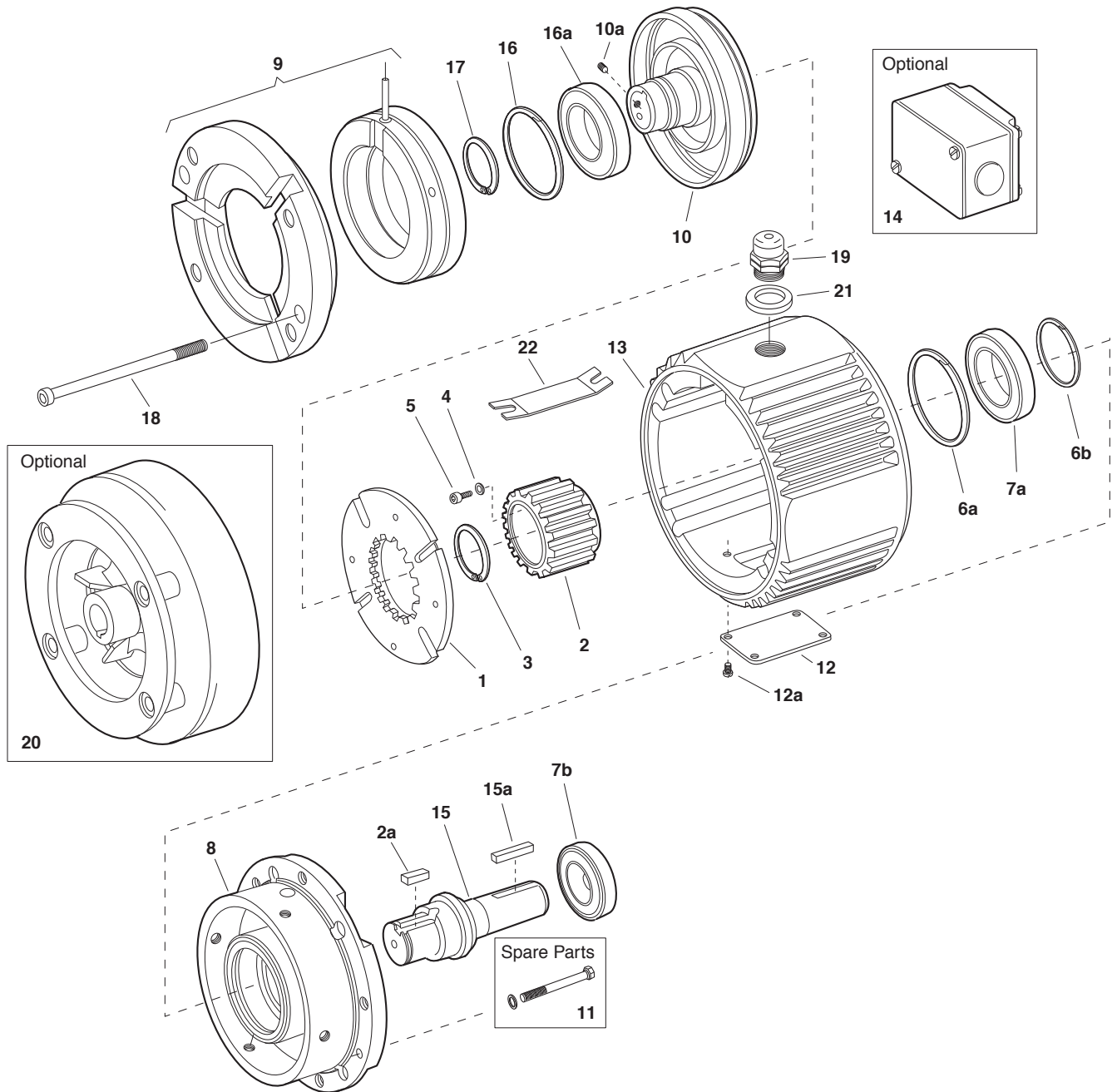
These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.



Service Parts

EUM Series Electro Module

EUM-1040 Clutch Combination



Service Parts

EUM Series Electro Module

EUM-1040 Clutch Combination

Component Parts

| Item | Description | EUM-50 | | EUM-180 | | EUM-210 | |
|------|--|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-011 | 1 | 5370-111-013 | 1 | 5371-111-005 | 1 |
| 2 | Armature Hub | 540-1638 | 1 | 540-1642 | 1 | 540-0741 | 1 |
| 2a | Key | 590-0043 | 1 | 590-0084 | 1 | | |
| 3 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | | |
| 4 | Lockwasher | | | | | 950-0121 | 6 |
| 5 | Capscrew | | | | | 797-0081 | 6 |
| 6a | Retaining Ring | 748-0113 | 1 | 748-0101 | 1 | 748-0112 | 1 |
| 6b | Retaining Ring | 748-0113 | 1 | | | | |
| 7a | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 7b | Ball Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0144 | 1 |
| 8 | Endbell | 456-1014 | 1 | 456-1019 | 1 | 456-1017 | 1 |
| 9 | Clutch Field/Endbell Assembly 90 Volt | 5370-451-076 | 1 | 5370-451-085 | 1 | 5371-451-032 | 1 |
| 10 | Rotor/Hub Assembly | 5370-751-023 | 1 | 5370-751-024 | 1 | 5371-751-014 | 1 |
| 10a | Set Screws | 797-1098 | 2 | 797-0069 | 2 | 797-1098 | 2 |
| 11 | Mounting Accessory Kit | 5370-101-040 | 1 | 5370-101-040 | 1 | 5371-101-024 | 1 |
| 12 | Cover Plate | 686-1055 | 1 | 686-1055 | 1 | 686-1055 | 1 |
| 12a | Cover Plate Screws | 797-0575 | 4 | 797-0575 | 4 | 797-0575 | 4 |
| 13 | Center Housing | 535-0176 | 1 | 535-0176 | 1 | 535-0177 | 1 |
| 14 | Conduit Box (optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 15 | Shaft | 798-0046 | 1 | 798-0085 | 1 | 798-0051 | 1 |
| 15a | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0019 | 1 |
| 16 | Retaining Ring | 748-0101 | 2 | 748-0101 | 1 | 748-0558 | 1 |
| 16a | Ball Bearing | 166-0150 | 1 | 166-0300 | 1 | 166-0168 | 1 |
| 17 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0067 | 1 |
| 18 | Assembly Bolts | 797-1433 | 2 | 797-1433 | 2 | 797-1438 | 2 |
| 19 | Connector | 280-0038 | 1 | 280-0038 | 1 | 280-0038 | 1 |
| 20 | Accessory Fan (optional) | 5370-101-055 | 1 | 5370-101-054 | 1 | 5371-101-029 | 1 |
| 21 | Washer | 950-0441 | 1 | 950-0441 | 1 | 950-0441 | 1 |
| 22 | Insulator | 572-0327 | 1 | 572-0327 | 1 | 572-0327 | 1 |
| | Key Accessory | 5370-101-072 | 1 | 5370-101-072 | 1 | 5371-101-043 | 1 |

Refer to Service Manual P-213.

These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.

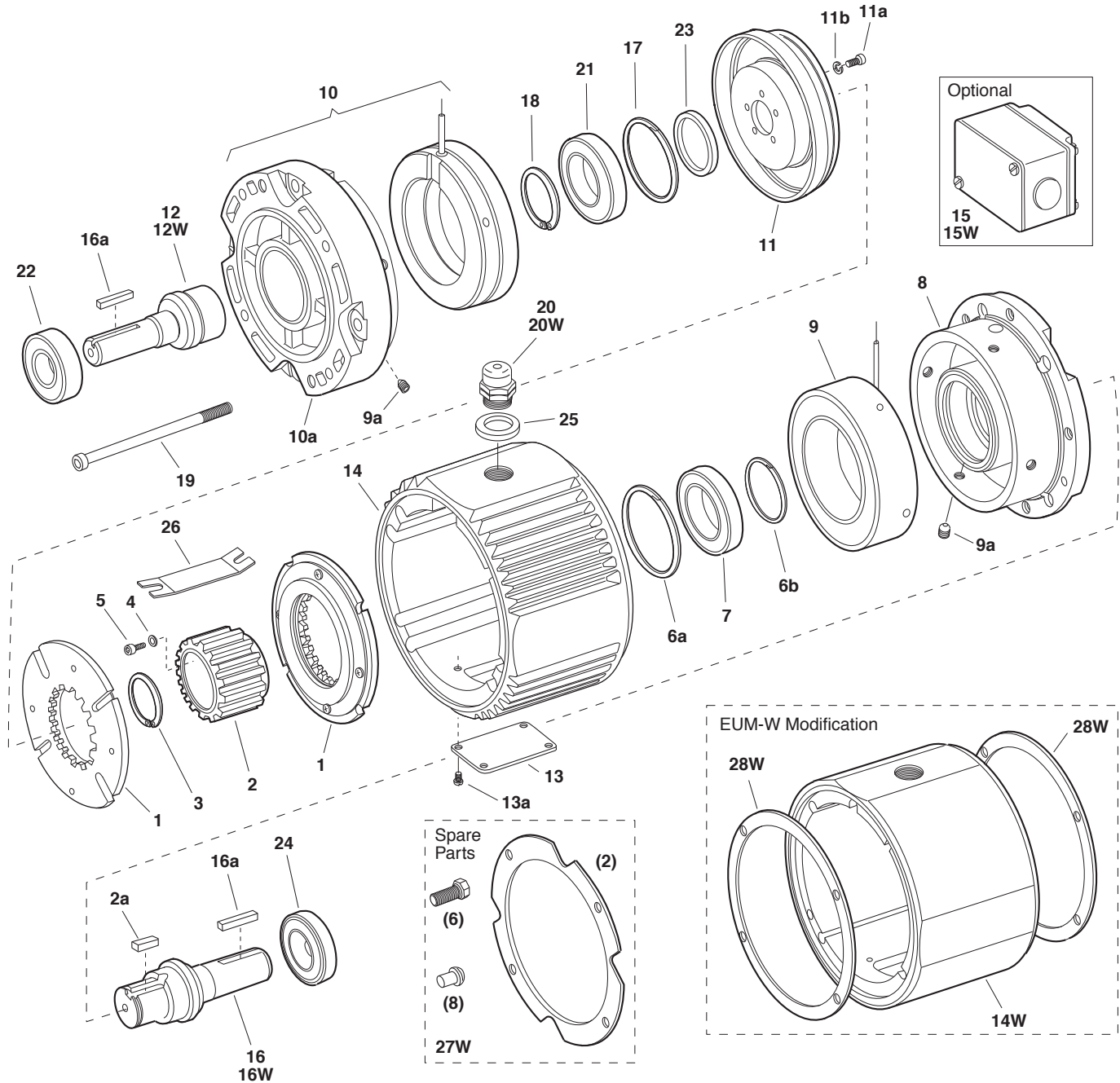


Service Parts

EUM/EUM-W Series Electro Module

EUM-2030 Clutch/Brake Combination

EUM-W-2030 Clutch/Brake Combination



Service Parts

EUM/EUM-W Series Electro Module

EUM-2030 Clutch/Brake Combination EUM-W-2030 Clutch/Brake Combination

Component Parts

| Item | Description | EUM-50 | | EUM-180 | | EUM-210 | |
|---------------------------|---|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Assembly | 5370-111-011 | 2 | 5370-111-013 | 2 | 5371-111-005 | 2 |
| 2 | Armature Hub | 540-1638 | 1 | 540-1642 | 1 | 540-0741 | 1 |
| 2a | Key | 590-0043 | 1 | 590-0084 | 1 | | |
| 3 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | | |
| 4 | Lockwasher | | | | | 950-0121 | 6 |
| 5 | Capscrew | | | | | 797-0081 | 6 |
| 6a | Retaining Ring | 748-0113 | 2 | 748-0101 | 1 | 748-0112 | 1 |
| 6b | Retaining Ring | | | | | 748-2002 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 8 | Endbell/Brake | 456-1014 | 1 | 456-1019 | 1 | 456-1017 | 1 |
| 9 | Brake Magnet | | 1 | | 1 | | 1 |
| | 6 volt | 5370-631-037 | | 5370-631-002 | | 5371-631-002 | |
| | 24 volt | 5370-631-038 | | 5370-631-005 | | 5371-631-005 | |
| | 90 volt | 5370-631-036 | | 5370-631-003 | | 5371-631-003 | |
| 9a | Set Screws | 797-0471 | 4 | 797-0471 | 4 | 797-0471 | 8 |
| 10 | Field (with Endbell EUM-50 and EUM-180) | | 1 | | 1 | | 1 |
| | 6 volt | 5370-451-082 | | 5370-451-090 | | 5371-451-002 | |
| | 24 volt | 5370-451-083 | | 5370-451-091 | | 5371-451-005 | |
| | 90 volt | 5370-451-081 | | 5370-451-089 | | 5371-451-003 | |
| 10a | Endbell (EUM-210 only) | | | | | 456-1018 | 1 |
| 11 | Rotor | 5370-751-033 | 1 | 5370-751-034 | 1 | 5371-751-006 | 1 |
| 11a | Screw | 797-1294 | 4 | 797-1214 | 5 | 797-0081 | 6 |
| 11b | Washer | 950-0102 | 4 | 950-0102 | 5 | 950-0121 | 6 |
| 12 | Shaft/Clutch | 798-0047 | 1 | 798-0124 | 1 | 798-0123 | 1 |
| 13 | Cover Plate | 686-1055 | 1 | 686-1055 | 1 | 686-1055 | 1 |
| 13a | Screws | 797-0575 | 4 | 797-0575 | 4 | 797-0575 | 4 |
| 14 | Center Housing | 535-0176 | 1 | 535-0176 | 1 | 535-0177 | 1 |
| 15 | Conduit Box (optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 16 | Shaft/Brake | 798-0046 | 1 | 798-0085 | 1 | 798-0051 | 1 |
| 16a | Key | 590-0029 | 2 | 590-0029 | 2 | 590-0019 | 2 |
| 17 | Retaining Ring | 748-0113 | 2 | 748-0101 | 1 | 748-0112 | 1 |
| 18 | Retaining Ring | 748-0017 | 1 | | | 748-0202 | 1 |
| 19 | Assembly Bolts | 797-1477 | 2 | 797-1477 | 2 | 797-1476 | 2 |
| 20 | Connector | 280-0038 | 1 | 280-0038 | 1 | 280-0038 | 1 |
| 21 | Bearing | 166-0149 | 1 | 166-0101 | 1 | 166-0142 | 1 |
| 22 | Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0144 | 1 |
| 23 | Spacer | | | 807-0062 | 1 | 807-0061 | 1 |
| 24 | Bearing | 166-0155 | 1 | 166-0143 | 1 | 166-0144 | 1 |
| 25 | Washer | 950-0441 | 1 | 950-0441 | 1 | 950-0441 | 1 |
| 26 | Insulator | 572-0327 | 1 | 572-0327 | 1 | 572-0327 | 1 |
| EUM-W Unique Parts | | | | | | | |
| 12W | Shaft/Clutch | 798-0264 | 1 | 798-0261 | 1 | 798-0260 | 1 |
| 14W | Center Housing for Washdown | 535-0181 | 1 | 535-0181 | 1 | 535-0182 | 1 |
| 15W | Conduit Box Kit (optional) | 5370-101-045 | 1 | 5370-101-045 | 1 | 5370-101-045 | 1 |
| 16W | Shaft/Brake | 798-0263 | 1 | 798-0262 | 1 | 798-0259 | 1 |
| 20W | Conduit Connector | 280-0058 | 1 | 280-0058 | 1 | 280-0058 | 1 |
| 27W | Washdown Mounting Kit | 5370-101-051 | 1 | 5370-101-051 | 1 | 5371-101-027 | 1 |
| 28W | Gasket/Seal Repair Kit | 5370-101-058 | 1 | 5370-101-058 | 1 | 5371-101-032 | 1 |

Refer to Service Manual P-213.

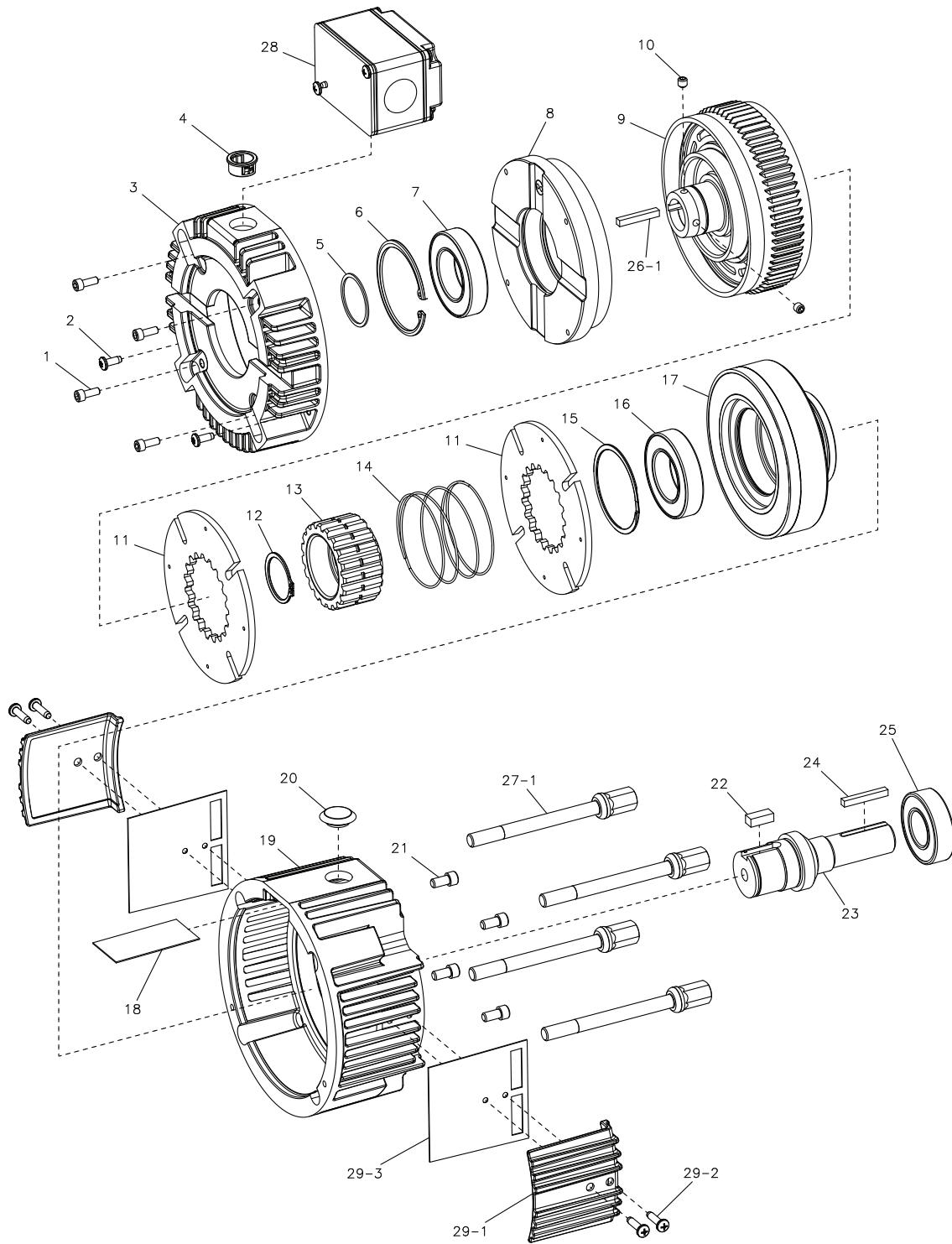
These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.



Service Parts

UM Series Smooth-Start UniModules

UM-1020-LK Clutch/Brake Combination



Service Parts

UM Series Smooth-Start UniModules

UM-1020-LK Clutch/Brake Combination

Component Parts

| Item | Description | UM-50 | | UM-100 | | UM-180 | |
|------|----------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Field Mounting Screw | 797-1214 | 4 | 797-1214 | 4 | 797-1214 | 4 |
| 2 | Screw | 797-1568 | 2 | 797-1568 | 2 | 797-1568 | 2 |
| 3 | Housing | 535-0204 | 1 | 535-0204 | 1 | 535-0204 | 1 |
| 4 | Bushing | 572-0522 | 1 | 572-0522 | 1 | 572-0522 | 1 |
| 5 | Retaining Ring | 748-0018 | 1 | 748-0018 | 1 | 748-0018 | 1 |
| 6 | Retaining Ring | 748-0561 | 1 | 748-0561 | 1 | 748-0561 | 1 |
| 7 | Ball Bearing | 166-0150 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 8 | Field Assembly 90 Volt | 5370-451-204 | 1 | 5370-451-209 | 1 | 5370-451-209 | 1 |
| 9 | Rotor Assembly | 5370-751-046 | 1 | 5370-751-050 | 1 | 5370-751-051 | 1 |
| 10 | Set Screw | 797-1098 | 2 | 797-0069 | 2 | 797-0069 | 2 |
| 11 | Armature | 110-0067 | 2 | 110-0075 | 2 | 110-0075 | 2 |
| 12 | Retaining Ring | 748-0445 | 1 | 748-0676 | 1 | 748-0676 | 1 |
| 13 | Armature Hub | 540-1638 | 1 | 540-2038 | 1 | 540-2038 | 1 |
| 14 | Spring | 808-0449 | 1 | 808-0450 | 1 | 808-0450 | 1 |
| 15 | Retaining Ring | 748-2044 | 1 | 748-0101 | 1 | 748-0101 | 1 |
| 16 | Ball Bearing | 166-0143 | 1 | 166-0150 | 1 | 166-0150 | 1 |
| 17 | Magnet Assembly 90 Volt | 5370-631-214 | 1 | 5370-631-229 | 1 | 5370-631-229 | 1 |
| 18 | Insulator | 572-1029 | 1 | 572-1029 | 1 | 572-1029 | 1 |
| 19 | Housing | 535-0206 | 1 | 535-0206 | 1 | 535-0206 | 1 |
| 20 | Plug | 680-0037 | 1 | 680-0037 | 1 | 680-0037 | 1 |
| 21 | Magnet Mounting Screw | 797-0077 | 4 | 797-1358 | 4 | 797-1358 | 4 |
| 22 | Key | 590-0043 | 1 | 590-0084 | 1 | 590-0084 | 1 |
| 23 | Shaft | 798-0298 | 1 | 798-0301 | 1 | 798-0304 | 1 |
| 24 | Key | 590-0029 | 1 | 590-0029 | 1 | 590-0029 | 1 |
| 25 | Ball Bearing | 166-0143 | 1 | 166-0143 | 1 | 166-0143 | 1 |
| 26 | Mounting Accessory | 5370-101-072 | 1 | 5370-101-072 | 1 | 5370-101-072 | 1 |
| | 26-1 Key | 590-0142 | 1 | 590-0142 | 1 | 590-0142 | 1 |
| 27 | Mounting Accessory | 5370-101-075 | 1 | 5370-101-075 | 1 | 5370-101-075 | 1 |
| | 27-1 Tie Bolt | 825-0014 | 4 | 825-0014 | 4 | 825-0014 | 4 |
| 28 | Conduit Box (Optional) | 5370-101-042 | 1 | 5370-101-042 | 1 | 5370-101-042 | 1 |
| 29 | Cover Kit (Optional) | 5370-101-076 | 1 | 5370-101-076 | 1 | 5370-101-076 | 1 |
| | 29-1 Cover | 258-1227 | 2 | 258-1227 | 2 | 258-1227 | 2 |
| | 29-2 Screw | 797-1562 | 4 | 797-1562 | 4 | 797-1562 | 4 |
| | 29-3 Gasket | 495-0042 | 2 | 495-0042 | 2 | 495-0042 | 2 |

Refer to Service Manual P-213.

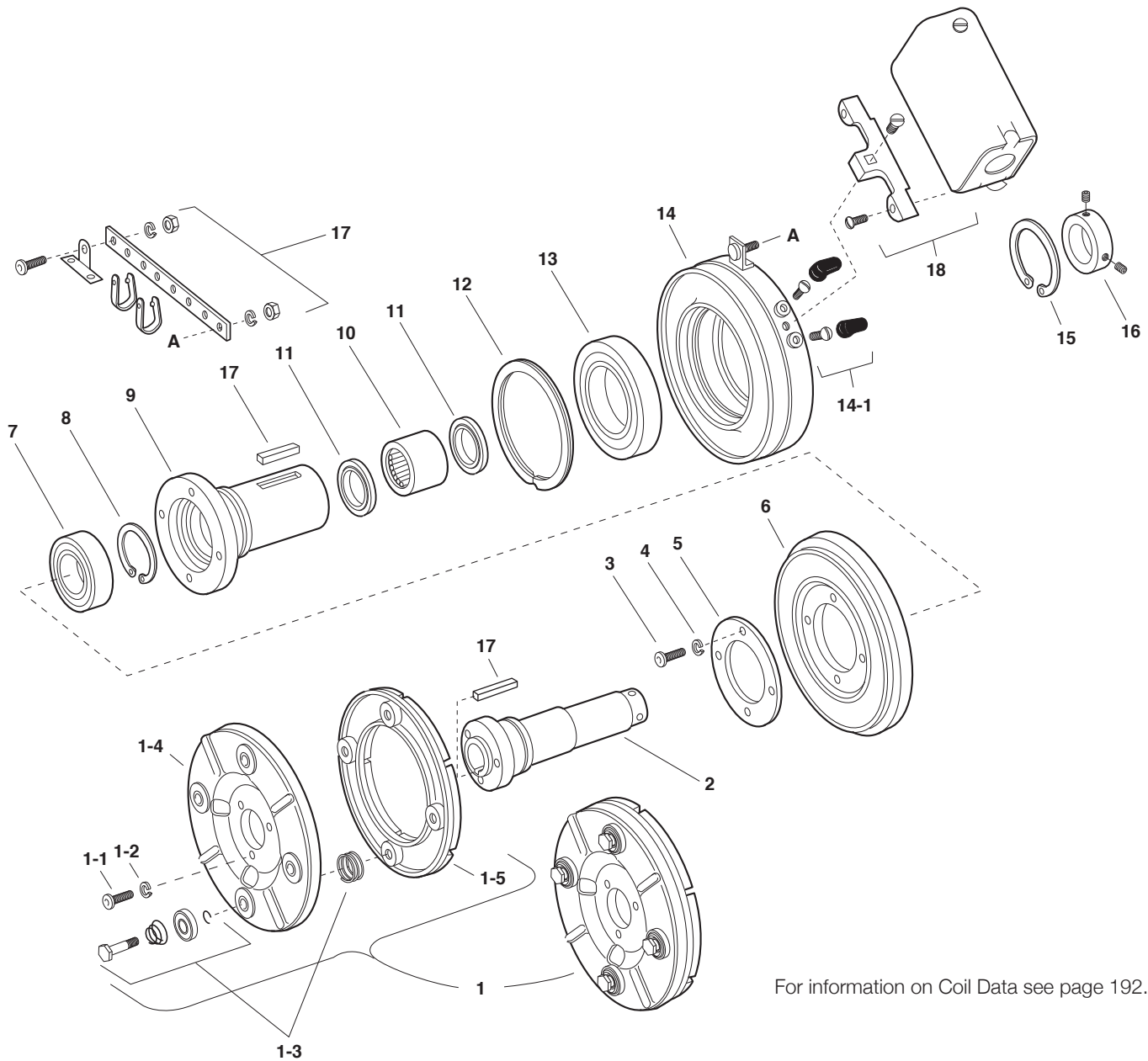
These units meet the standards of UL 508 and are listed under guide card #NMTR 2, file #59164.



Service Parts

EC Series Electro Clutch

EC-375, EC-475, EC-650



For information on Coil Data see page 192.

Electrical and Mechanical Data

| Model Size | Voltage DC | Static Torque (lb. ft.) | Max. Speed RPM | Armature & Carrier | Inertia-WR ² (lb. ft ²) | | | Total Inner Sleeve | Weight lbs. |
|------------|------------|-------------------------|----------------|--------------------|--|--------------|------|--------------------|-------------|
| | | | | | Rotor | Outer Sleeve | | | |
| EC-375 | 6 | 16 lb. ft. | 5000 | .010 | .018 | .001 | .001 | 4 | |
| | 24 | 16 lb. ft. | 5000 | .010 | .018 | .001 | .001 | 4 | |
| | 90 | 16 lb. ft. | 5000 | .010 | .018 | .001 | .001 | 4 | |
| EC-475 | 6 | 30 lb. ft. | 4500 | .072 | .033 | .006 | .002 | 8 | |
| | 24 | 30 lb. ft. | 4500 | .072 | .033 | .006 | .002 | 8 | |
| | 90 | 30 lb. ft. | 4500 | .072 | .033 | .006 | .002 | 8 | |
| EC-650 | 6 | 95 lb. ft. | 3600 | .106 | .202 | .010 | .013 | 18 | |
| | 24 | 95 lb. ft. | 3600 | .106 | .202 | .010 | .013 | 18 | |
| | 90 | 95 lb. ft. | 3600 | .106 | .202 | .010 | .013 | 18 | |

Service Parts

EC Series Electro Clutch

EC-375, EC-475, EC-650

Component Parts

| Item | Description | EC-375 | | EC-475 | | EC-650 | |
|-------------|-----------------------------|--------------|------|--------------|--------------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature & Carrier Assembly | 5380-101-006 | 1 | 5181-101-003 | 1 | 5281-101-003 | 1 |
| | 1-1 Capscrew | 797-1214 | 3 | 797-1214 | 3 | 797-0086 | 3 |
| | 1-2 Lockwasher | 950-0102 | 3 | 950-0102 | 3 | 950-0102 | 3 |
| | 1-3 Autogap Accessory | 5180-101-011 | 3 | 5181-101-010 | 4 | 5181-101-010 | 4 |
| | 1-4 Carrier | 5380-295-002 | 1 | 5181-295-002 | 1 | 5281-295-002 | 1 |
| | 1-5 Armature | 5180-111-002 | 1 | 5181-111-002 | 1 | 5281-111-002 | 1 |
| 2 | Inner Sleeve | | 1 | | 1 | | 1 |
| | 1/2" Bore | 803-0054 | | | | | |
| | 5/8" Bore | 803-0055 | | 803-1007 | | | |
| | 3/4" Bore | | | 803-1005 | | | |
| | 7/8" Bore | | | 803-1006 | | | |
| | 1" Bore | | | | | 803-0047 | |
| | 1-1/8" Bore | | | | | 803-0049 | |
| | 1-1/4" Bore | | | | | 803-0048 | |
| 1-3/8" Bore | | | | | 803-0050 | | |
| 3 | Screw | 797-1050 | 6 | 797-1039 | 4 | 797-0083 | 4 |
| 4 | Lockwasher | 950-0105 | 6 | 950-0102 | 4 | 950-0103 | 4 |
| 5 | Retainer Plate | 748-0391 | 1 | 748-0393 | 1 | 748-0389 | 1 |
| 6 | Rotor | 5180-751-001 | 1 | 5181-751-003 | 1 | 5281-751-001 | 1 |
| 7 | Ball Bearing | 166-0149 | 1 | 166-2016 | 2 | 166-0110 | 1 |
| 8 | Retainer ring | 748-0017 | 1 | 748-0023 | 2 | 748-0002 | 1 |
| 9 | Outer Sleeve | 5180-104-001 | 1 | 803-1003 | 1 | 5281-104-001 | 1 |
| 10 | Sleeve Bearing | 166-0177 | 1 | 166-0179 | 1 | 166-0178 | 1 |
| 11 | Oil Seal | 795-0027 | 2 | 795-0028 | 2 | 795-0026 | 2 |
| 12 | Retainer Ring | 748-0101 | 1 | 748-0102 | 1 | 748-0104 | 1 |
| 13 | Ball Bearing | 166-0150 | 1 | 166-0110 | 1 | 166-0104 | 1 |
| 14 | Field | | 1 | | 1 | | 1 |
| | 6 volt | 5180-451-002 | | 5181-451-002 | | 5281-451-002 | |
| | 24 volt | 5180-451-004 | | 5181-451-004 | | 5281-451-004 | |
| | 90 volt | 5180-451-005 | | 5181-451-005 | | 5281-451-005 | |
| | 14-1 Terminal Accessory | 5103-101-002 | 1 | 5103-101-002 | 1 | 5311-101-001 | 1 |
| 15 | Retainer Ring | 748-0018 | 1 | 748-0002 | 1 | 748-0004 | 1 |
| 16 | Set Collar | 266-0011 | 1 | 266-0012 | 1 | 266-0010 | 1 |
| 17 | Accessory, W/Keys | | 1 | | 1 | | 1 |
| | 1/2" Bore | 5180-101-001 | | | | | |
| | 5/8" Bore | 5180-101-001 | | 5181-101-001 | | | |
| | 3/4" Bore | | | 5181-101-001 | | | |
| | 7/8" Bore | | | 5181-101-002 | | | |
| | 1" Bore | | | | | 5281-101-001 | |
| | 1-1/8" Bore | | | | | 5281-101-001 | |
| | 1-1/4" Bore | | | | | 5281-101-001 | |
| 1-3/8" Bore | | | | | 5281-101-002 | | |
| 18 | Conduit Box | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 |

These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164. Refer to Service Manual P-210.

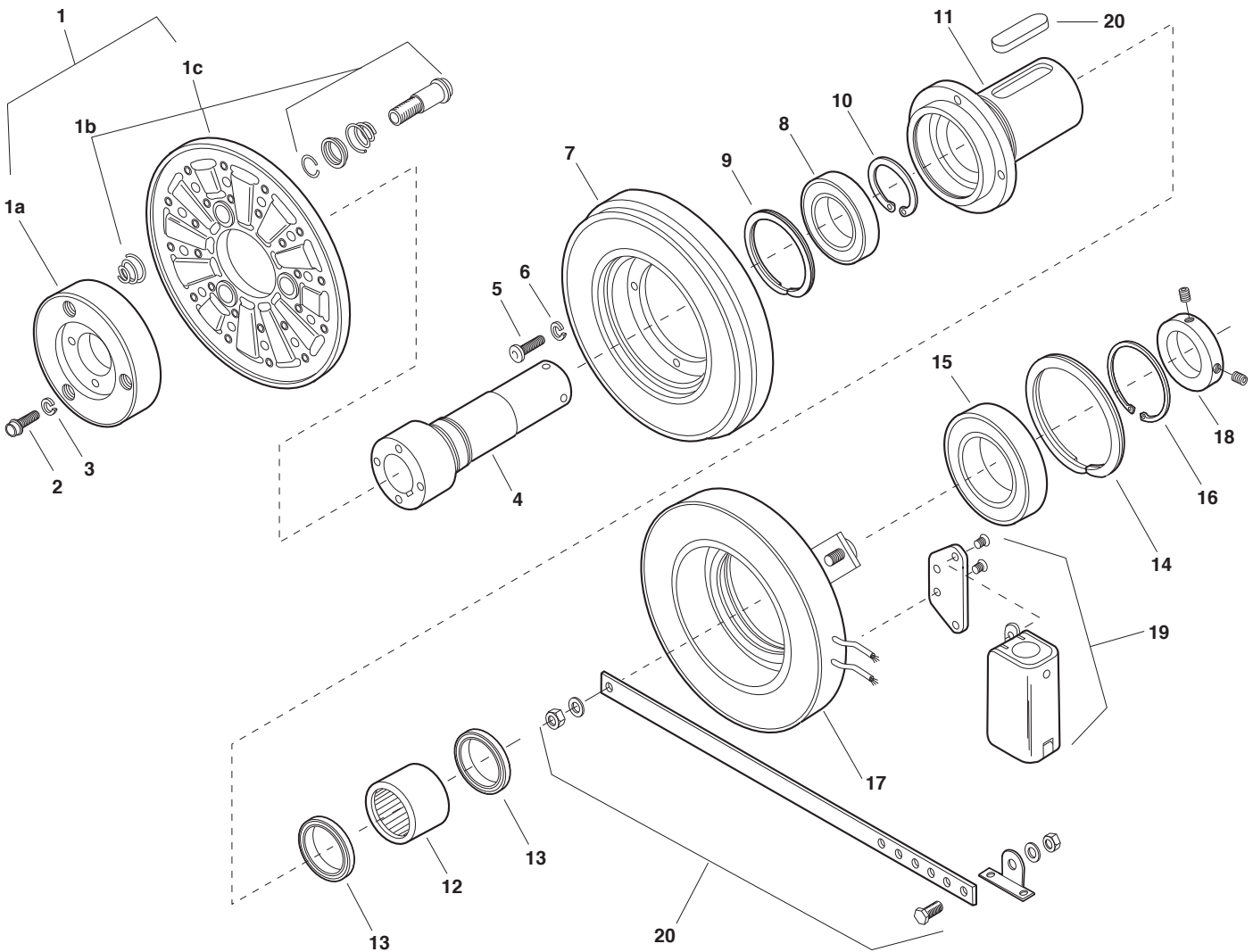
Note: For EC-475 built prior to 2005, contact Warner Electric for service parts.



Service Parts

EC Series Electro Clutch

EC-825



Service Parts

Component Parts

| | | EC-825 | |
|-----------|----------------------|--------------|------|
| Item | Description | Part No. | Qty. |
| 1 | Armature Assembly | 5282-111-002 | 1 |
| | 1a Hub | 540-1298 | 1 |
| | 1b Autogap Accessory | 5201-101-068 | 3 |
| | 1c Armature | 5282-111-001 | 1 |
| 2 | Capscrew | 797-0081 | 4 |
| 3 | Lockwasher | 950-0103 | 4 |
| 4 | Inner Sleeve | | 1 |
| | 1-1/8" Bore | 803-0069 | |
| | 1-1/4" Bore | 803-0070 | |
| | 1-3/8" Bore | 803-0071 | |
| 5 | Capscrew | 797-0086 | 4 |
| 6 | Lockwasher | 950-0103 | 4 |
| 7 | Rotor Assembly | 5282-751-001 | 1 |
| 8 | Ball Bearing | 166-0110 | 1 |
| 9 | Retainer Ring | 748-0102 | 1 |
| 10 | Retainer Ring | 748-0002 | 1 |
| 11 | Rotor Adapter | 5282-105-002 | 1 |

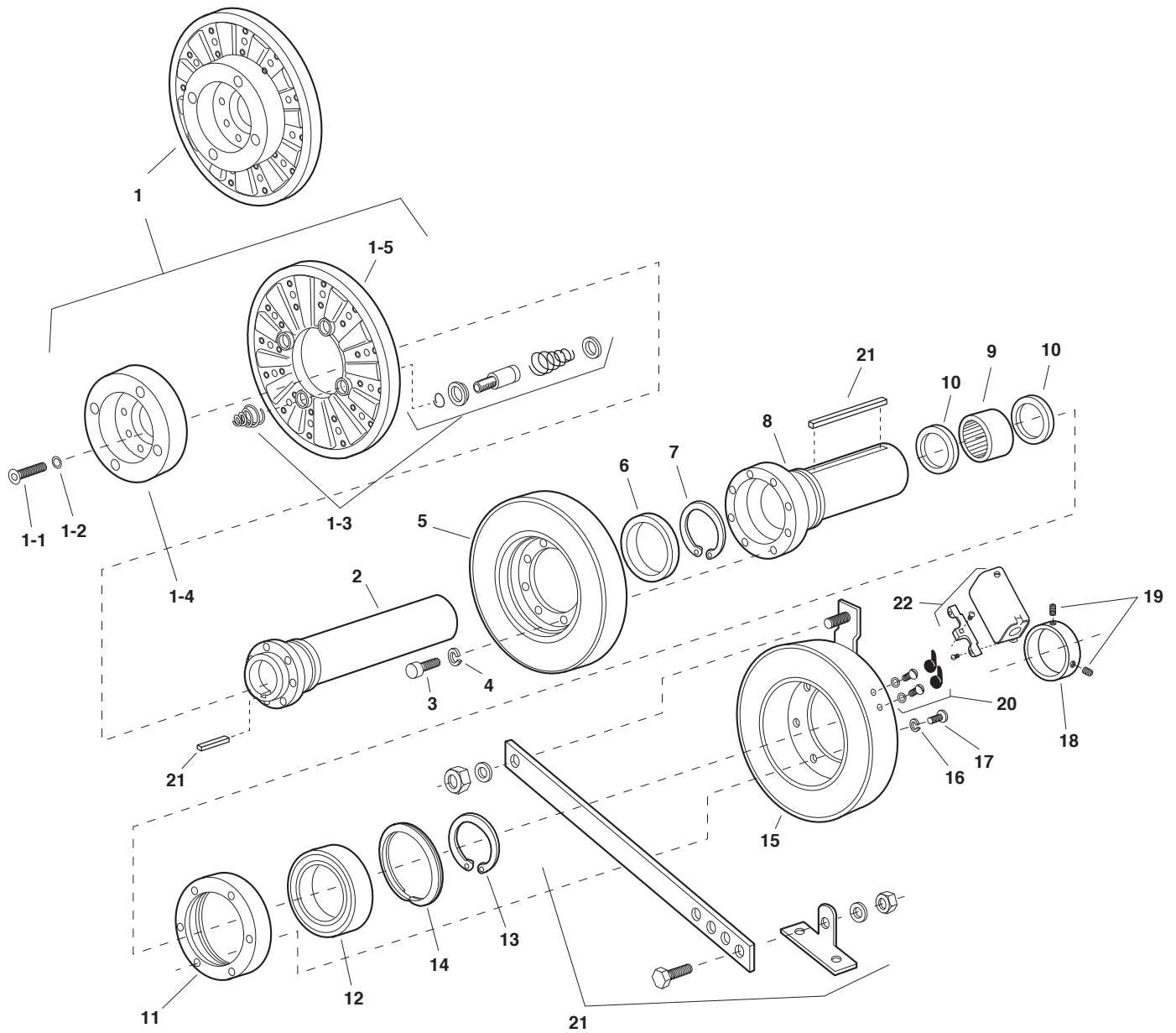
| | | EC-825 | |
|-----------|------------------------------|--------------|------|
| Item | Description | Part No. | Qty. |
| 12 | Roller Bearing | 166-0178 | 1 |
| 13 | Oil Seal | 795-0026 | 2 |
| 14 | Retainer Ring | 748-0104 | 1 |
| 15 | Ball Bearing | 166-0104 | 1 |
| 16 | Retainer Ring | 748-0004 | 1 |
| | Field | | 1 |
| 17 | 6 volt | 5282-451-002 | |
| | 24 volt | 5282-451-004 | |
| | 90 volt | 5282-451-005 | |
| 18 | Set Collar | 266-0010 | 1 |
| 19 | Conduit Box | 5200-101-012 | 1 |
| 20 | Mounting Accessory with Keys | 5282-101-001 | 1 |

Refer to Service Manual P-210.
 These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164.



EC Series Electro Clutch

EC-1000, EC-1225



Service Parts

Component Parts

| Item | Description | EC-1000 | | EC-1225 | |
|------|------------------------------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature & Carrier Assembly | 5283-111-001 | 1 | 5284-111-001 | 1 |
| | 1-1 Capscrew | 797-1163 | 6 | 797-1163 | 8 |
| | 1-2 Lockwasher | 950-0111 | 6 | 950-0111 | 8 |
| | 1-3 Autogap Accessory | 5201-101-008 | 3 | 5201-101-008 | 4 |
| | 1-4 Hub | 540-1338 | 1 | 540-1340 | 1 |
| | 1-5 Armature | 5302-111-013 | 1 | 5385-111-003 | 1 |
| 2 | Inner Sleeve | | 1 | | 1 |
| | 3/8" Bore | 803-0027 | | | |
| | 1-1/2" Bore | 803-0166 | | | |
| | 1-5/8" Bore | 803-0028 | | | |
| | 1-5/8" Bore | | | 803-0078 | |
| 3 | 1-7/8" Bore | | | 803-0030 | |
| | 2-1/8" Bore | | | 803-0031 | |
| 3 | Capscrew | 797-0083 | 8 | 797-0416 | 8 |
| 4 | Lockwasher | 950-0103 | 8 | 950-0106 | 8 |
| 5 | Rotor Assembly | 5283-101-002 | 1 | 5284-101-006 | 1 |
| 6 | Ball Bearing | 166-0168 | 1 | 166-0170 | 1 |
| 7 | Retainer Ring | 748-0067 | 1 | 748-0503 | 1 |
| 8 | Outer Sleeve | 803-0025 | 1 | 803-0032 | 1 |
| 9 | Roller Bearing | 166-0180 | 1 | 166-0181 | 1 |
| 10 | Oil Seal | 795-0029 | 2 | 795-0033 | 2 |
| 11 | Adapter Ring | 748-0480 | 1 | 748-0466 | 1 |
| 12 | Ball Bearing | 166-0163 | 1 | 166-0163 | 1 |
| 13 | Retainer Ring | 748-0502 | 1 | 748-0502 | 1 |
| 14 | Retainer Ring | 748-0114 | 1 | 748-0114 | 1 |
| 15 | Field | | 1 | | 1 |
| | 6 volt | 5283-451-002 | | 5284-451-002 | |
| | 24 volt | 5283-451-010 | | 5284-451-010 | |
| 16 | 90 volt | 5283-451-003 | | 5284-451-003 | |
| | Lockwasher | 950-0355 | 6 | 950-0359 | 6 |
| 17 | Capscrew | 797-0083 | 6 | 797-0416 | 6 |
| 18 | Set Collar | 266-0015 | 1 | 266-0016 | 1 |
| 19 | Set Screw | 797-0468 | 2 | 797-0130 | 2 |
| 20 | Terminal Accessory | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 21 | Mounting Accessory with Keys | | 1 | | 1 |
| | 1-3/8" Bore | 5283-101-005 | | | |
| | 1-1/2" Bore | 5283-101-009 | | | |
| | 1-5/8" Bore | 5283-101-006 | | 5284-101-007 | |
| | 1-7/8" Bore | | | 5284-101-001 | |
| 22 | 2-1/8" Bore | | | 5284-101-002 | |
| 22 | Conduit Box | 5200-101-011 | 1 | 5200-101-011 | 1 |

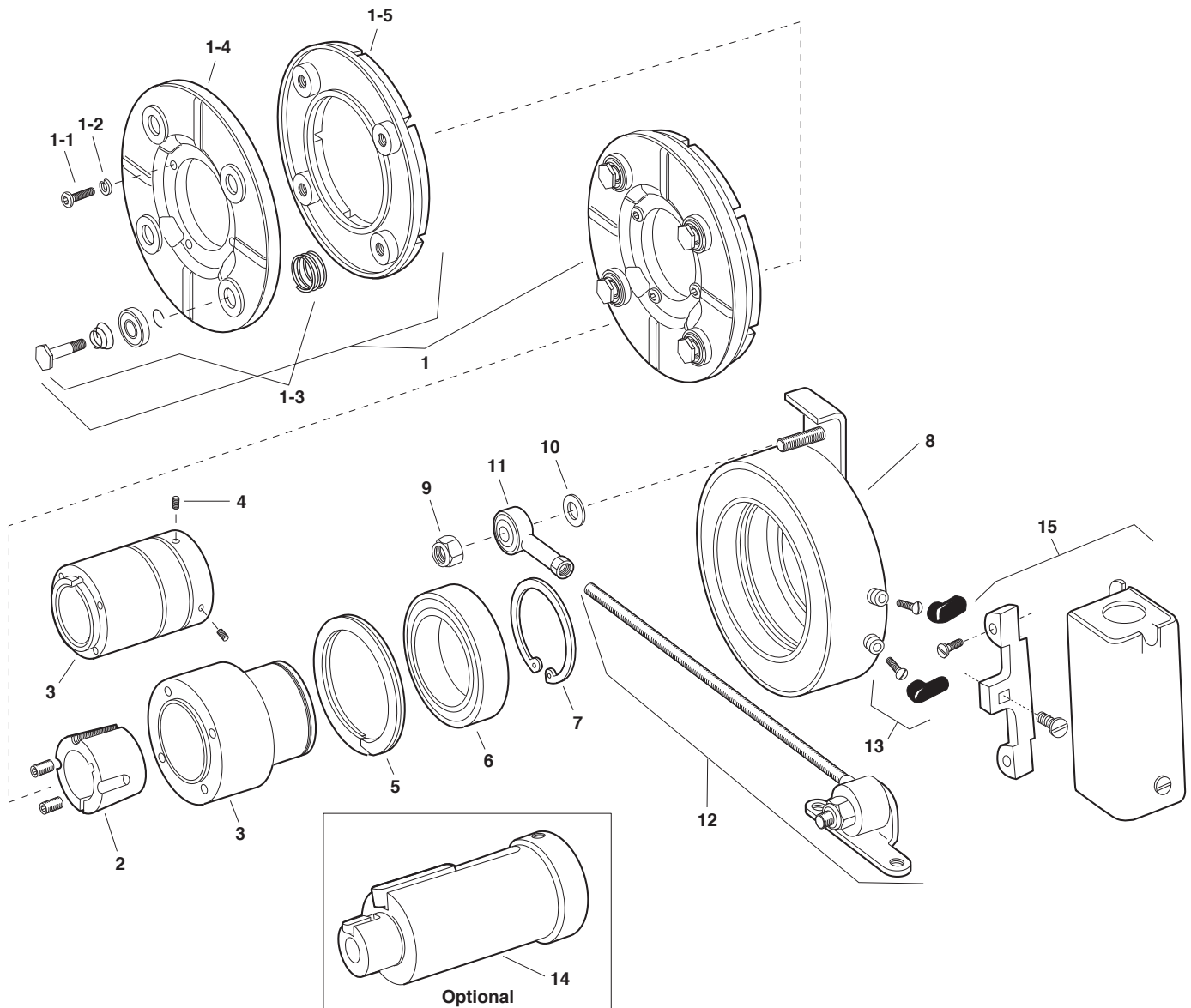
Refer to Service Manual P-210.

These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164.



EB Series Electro Brake

EB-375, EB-475, EB-650



Service Parts

EB Series Electro Brake

EB-375, EB-475, EB-650

Component Parts

| Item | Description | EB-375 | | EB-475 | | EB-650 | |
|------|-----------------------------|--------------|------|--------------------------------------|------|--|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature & Carrier Assembly | 5380-101-006 | 1 | 5381-101-004 | 1 | 5382-101-005 | 1 |
| | 1-1 Capscrew | 797-1214 | 3 | 797-1214 | 4 | 797-0086 | 4 |
| | 1-2 Lockwasher | 950-0102 | 3 | 950-0102 | 4 | 950-0103 | 4 |
| | 1-3 Autogap Accessory | 5180-101-011 | 3 | 5181-101-010 | 4 | 5181-101-010 | 4 |
| | 1-4 Carrier | 5380-295-002 | 1 | 5381-295-003 | 1 | 5382-295-002 | 1 |
| | 1-5 Armature | 5180-111-002 | 1 | 5181-111-002 | 1 | 5281-111-002 | 1 |
| 2 | *Bushing | | | 180-0410-180-0418 1/2" to 1" bore | 1 | 180-0421-180-0435 1/2" to 1-3/8" bore | 1 |
| 3 | Hub | | 1 | 540-0524 | 1 | 540-0523 | 1 |
| | 1/2" Bore | 540-0520 | | | | | |
| | 5/8" Bore | 540-0519 | | | | | |
| 4 | Set Screw | | 2 | | | | |
| | 1/2" Bore | 797-0368 | | | | | |
| | 5/8" Bore | 797-0366 | | | | | |
| 5 | Retainer Ring | 748-0101 | 1 | 748-0102 | 1 | 748-0104 | 1 |
| 6 | Ball Bearing | 166-0150 | 1 | 166-0110 | 1 | 166-0104 | 1 |
| 7 | Retainer Ring | 748-0018 | 1 | 748-0002 | 1 | 748-0004 | 1 |
| 8 | Magnet | | 1 | | 1 | | 1 |
| | 6 volt | 5380-631-003 | | 5381-631-003 | | 5382-631-003 | |
| | 24 volt | 5380-631-004 | | 5381-631-004 | | 5382-631-005 | |
| | 90 volt | 5380-631-002 | | 5381-631-002 | | 5382-631-002 | |
| 9 | Locknut | 661-0050 | 1 | 661-0051 | 1 | 661-0004 | 1 |
| 10 | Washer | 950-0029 | 1 | 950-0026 | 1 | 950-0030 | 1 |
| 11 | Rod End Bearing | 166-0186 | 1 | 166-0187 | 1 | 166-0188 | 1 |
| 12 | Torque Arm Rod Assembly | 5380-112-001 | 1 | 5381-112-001 | 1 | 5382-112-001 | 1 |
| 13 | Terminal Accessory | 5311-101-001 | 1 | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 14 | Adapter (optional) | | 1 | | 1 | | 1 |
| | 5/8" Motor Shaft | 5380-101-005 | | | | | |
| | 7/8" Motor Shaft | 5380-101-004 | | | | | |
| | 1-1/8" Motor Shaft | | | 5381-101-003 | | | |
| | 1-3/8" Motor Shaft | | | | | 5382-101-003 | |
| | 1-5/8" Motor Shaft | | | | | 5382-101-002 | |
| 15 | Conduit Box | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 |

*See page 198 for specific part numbers.

Refer to Service Manual P-211.

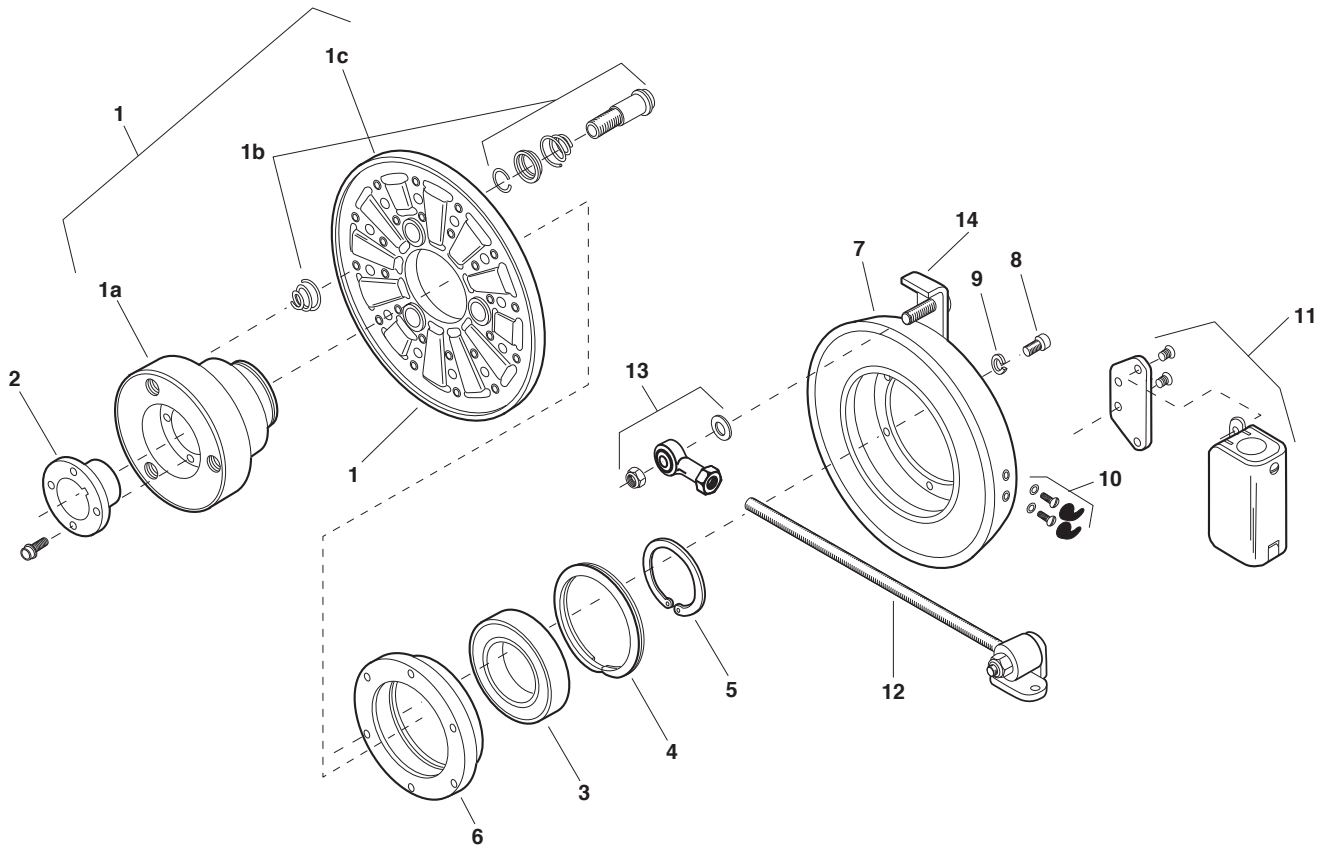
These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164.



Service Parts

EB Series Electro Brake

EB-825



Service Parts

Component Parts

| EB-825 | | | |
|--------|---------------------|---|------|
| Item | Description | Part No. | Qty. |
| 1 | Armature Assembly | 5383-111-001 | 1 |
| | 1a Hub | 540-1299 | 1 |
| | 1b Autogap Assembly | 5201-101-008 | 3 |
| | 1c Armature | 5282-111-001 | 1 |
| 2 | *Bushing | 180-0002 to 180-0018 1/2" to 1-1/2" Bore | 1 |
| 3 | Ball Bearing | 166-0168 | 1 |
| 4 | Retainer Ring | 748-0120 | 1 |
| 5 | Retainer Ring | 748-0584 | 1 |
| 6 | Adapter Ring | 748-0631 | 1 |

*See page 198 for specific part numbers.

Refer to Service Manual P-211.

These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164.

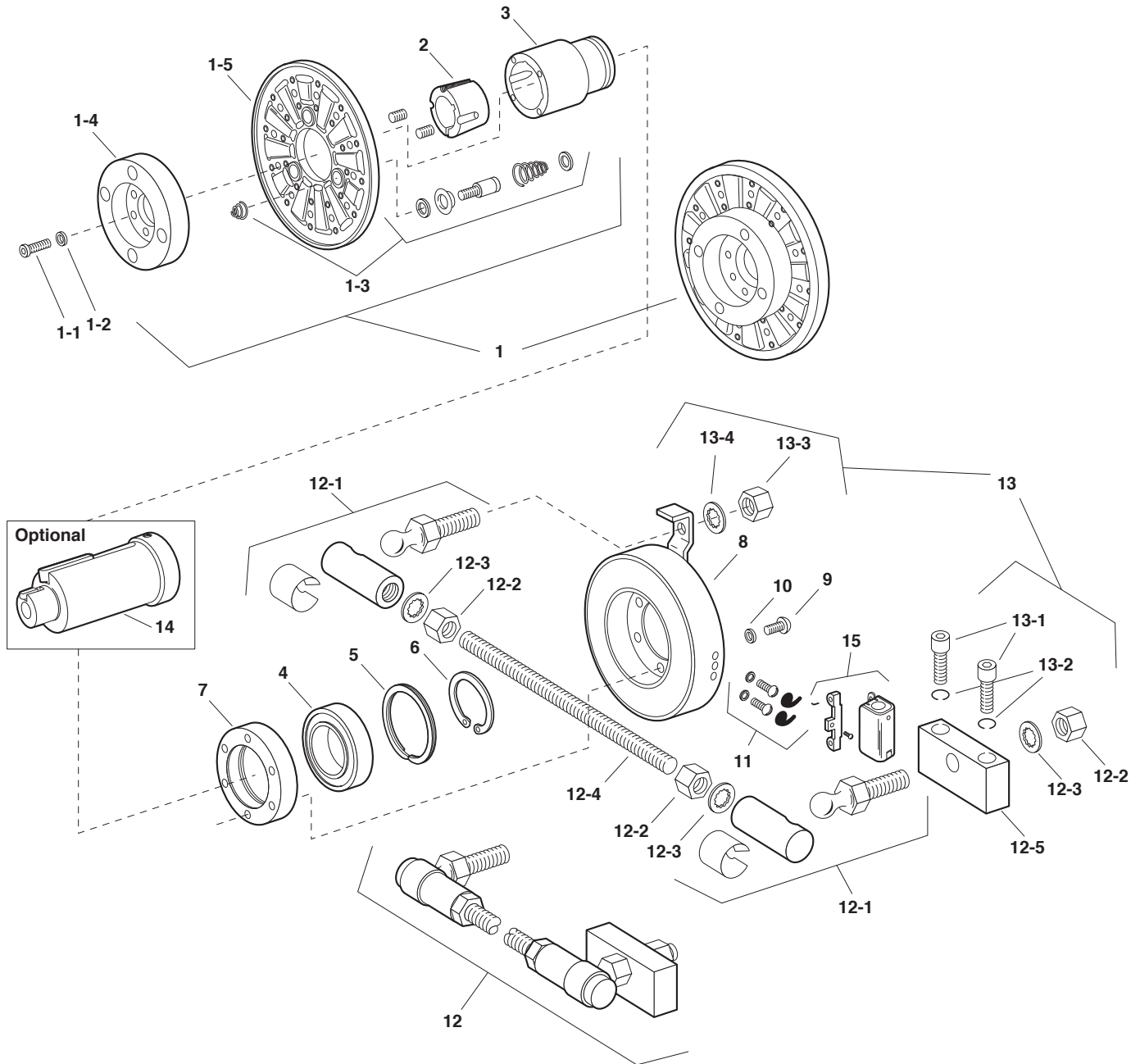


| EB-825 | | | |
|--------|--------------------------|--------------|------|
| Item | Description | Part No. | Qty. |
| 7 | Magnet Assembly | | 1 |
| | 6 volt | 5383-631-006 | |
| | 24 volt | 5383-631-007 | |
| | 90 volt | 5383-631-008 | |
| 8 | Capscrew | 797-0079 | 6 |
| 9 | Lockwasher | 950-0372 | 6 |
| 10 | Terminal Accessory | 5311-101-001 | 1 |
| 11 | Conduit Box | 5200-101-011 | 1 |
| 12 | Torque Arm Rod Assembly | 5382-112-001 | 1 |
| 13 | Rod End Assembly | 5382-101-007 | 1 |
| 14 | Torque Arm Kit (bolt-on) | 5383-101-001 | 1 |

Service Parts

EB Series Electro Brake

EB-1000, EB-1225



Service Parts

Component Parts

| Item | Description | EB-1000 | | EB-1225 | |
|------|-------------------------------|--|------|--|------|
| | | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature & Carrier Assembly | 5384-111-003 | 1 | 5385-111-004 | 1 |
| | 1-1 Capscrew | 797-1163 | 6 | 797-1163 | 8 |
| | 1-2 Lockwasher | 950-0111 | 6 | 950-0111 | 8 |
| | 1-3 Autogap Accessory | 5201-101-008 | 3 | 5201-101-008 | 4 |
| | 1-4 Hub | 540-1339 | 1 | 540-1341 | 1 |
| | 1-5 Armature | 5302-111-013 | 1 | 5385-111-003 | 1 |
| 2 | *Bushing | 180-0131-180-0149 1/2" to 1-5/8" bore | 1 | 180-0185-180-0217 1/2" to 2-1/2" bore | 1 |
| 3 | Hub | 540-0579 | 1 | 540-0578 | 1 |
| 4 | Ball Bearing | 166-0164 | 1 | 166-0163 | 1 |
| 5 | Retainer Ring | 748-0116 | 1 | 748-0114 | 1 |
| 6 | Retainer Ring | 748-0501 | 1 | 748-0074 | 1 |
| 7 | Adapter Ring | 748-0467 | 1 | 748-0465 | 1 |
| 8 | Magnet Assembly | | 1 | | 1 |
| | 6 volt | 5384-631-010 | | 5385-631-010 | |
| | 24 volt | 5384-631-011 | | 5385-631-011 | |
| | 90 volt | 5384-631-012 | | 5385-631-012 | |
| 9 | Capscrew | 797-0416 | 6 | 797-0416 | 6 |
| 10 | Lockwasher | 950-0106 | 6 | 950-0106 | 6 |
| 11 | Terminal Accessory | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 12 | Torque Arm Rod Assembly | 5385-757-001 | 1 | 5385-757-001 | 1 |
| | 12-1 Ball Joint | 585-0001 | 2 | 585-0001 | 2 |
| | 12-2 Jam Nut | 661-0012 | 3 | 661-0012 | 3 |
| | 12-3 Lockwasher | 950-0114 | 3 | 950-0114 | 3 |
| | 12-4 Threaded Rod | 756-0030 | 1 | 756-0030 | 1 |
| | 12-5 Bracket | 174-0073 | 1 | 174-0073 | 1 |
| 13 | Torque Arm Mounting Accessory | 5385-101-001 | 1 | 5385-101-001 | 1 |
| | 13-1 Capscrew | 797-0293 | 2 | 797-0293 | 2 |
| | 13-2 Lockwasher | 950-0354 | 2 | 950-0354 | 2 |
| | 13-3 Jam Nut | 661-0012 | 1 | 661-0012 | 1 |
| | 13-4 Lockwasher | 950-0114 | 1 | 950-0114 | 1 |
| 14 | Adapter (optional) | | 1 | | 1 |
| | 1-5/8" Motor Shaft | 5384-101-008 | | | |
| | 1-7/8" Motor Shaft | 5384-101-007 | | | |
| | 2-1/8" Motor Shaft | 5384-101-010 | | 5385-101-008 | |
| | 2-3/8" Motor Shaft | | | 5385-101-007 | |
| 15 | Conduit Box | 5200-101-011 | 1 | 5200-101-011 | 1 |

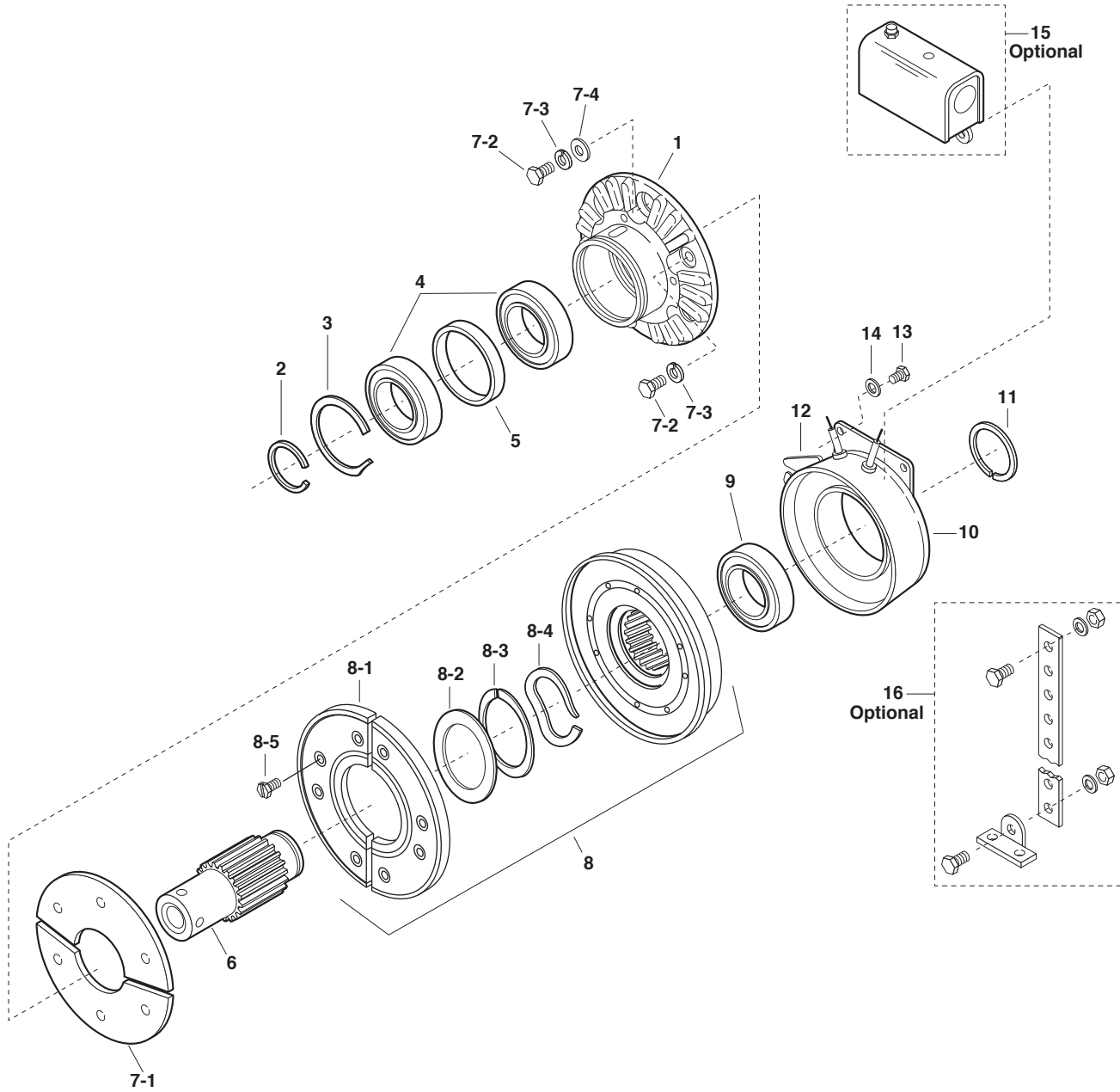
*See page 198 for specific part numbers.
Refer to Service Manual P-211.

These units when used with the correct Warner Electric conduit box, meets the standards of UL508 and are listed under guide care #NMTR, file #59164.



ATC Series AT Clutch

ATC-25, ATC-55, ATC-115



Service Parts

ATC Series AT Clutch

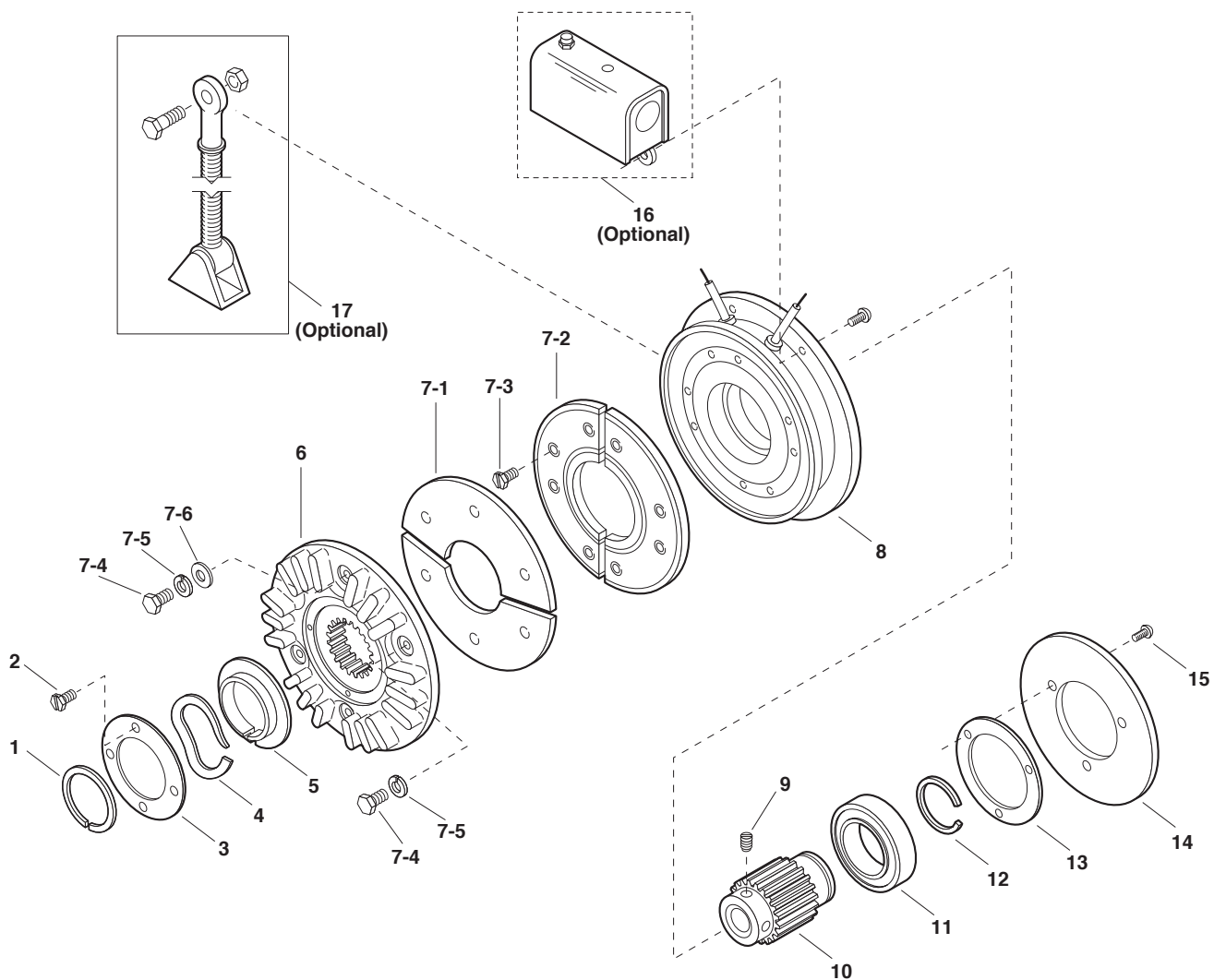
ATC-25, ATC-55, ATC-115

Component Parts

| Item | Description | ATC-25 | | ATC-55 | | ATC-115 | |
|---|-------------------------------|--------------|------|--------------|----------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Armature Hub | 540-0907 | 1 | 540-0852 | 1 | 540-0863 | 1 |
| 2 | Retaining Ring | 748-0732 | 1 | 748-0726 | 1 | 748-0737 | 1 |
| 3 | Retaining Ring | 748-0731 | 1 | 748-0728 | 1 | 748-0736 | 1 |
| 4 | Bearing | 166-0278 | 2 | 166-0277 | 2 | 166-0279 | 2 |
| 5 | Spacer | 807-0119 | 1 | 807-1061 | 1 | 807-1063 | 1 |
| 6 | Splined Hub | | 1 | | 1 | | 1 |
| | 1/2" Bore | 540-0910 | | | | | |
| | 5/8" Bore | 540-0911 | | | | | |
| | 3/4" Bore | 540-0912 | | 540-1501 | | | |
| | 7/8" Bore | 540-0913 | | 540-1502 | | | |
| | 1" Bore | | | 540-1503 | | | |
| | 1-1/8" Bore | | | 540-1504 | | 540-0857 | |
| | 1-1/4" Bore | | | | | 540-0858 | |
| 1-3/8" Bore | | | | | 540-0859 | | |
| 1-1/2" Bore | | | | | 540-0860 | | |
| *7-1 | Armature | 110-0220 | 1 | 110-0218 | 1 | 110-0223 | 1 |
| *7-2 | Screw | 797-1519 | 4 | 797-1462 | 6 | 797-1463 | 6 |
| *7-3 | Lockwasher | 950-0436 | 4 | 950-0355 | 6 | 950-0355 | 6 |
| *7-4 | Flatwasher | | | 950-0023 | 2 | 950-0023 | 2 |
| *8 | Rotor | 5161-751-001 | 1 | 5162-751-001 | 1 | 5163-751-001 | 1 |
| 8-1 | Facing Assembly | 5161-445-003 | 1 | 5162-445-003 | 1 | 5163-445-003 | 1 |
| 8-2 | Retainer Plate | | | | | 686-0108 | 1 |
| 8-3 | Detent Ring | 748-2031 | 1 | 748-2038 | 1 | 748-2020 | 1 |
| 8-4 | Wave Spring | 808-0404 | 1 | 808-0401 | 1 | 808-0384 | 2 |
| 8-5 | Machine Screw | 797-1389 | 8 | 797-1389 | 8 | 797-1389 | 8 |
| *9 | Bearing | 166-0283 | 1 | 166-0284 | 1 | 166-0279 | 1 |
| 10 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 volts DC | 5161-451-002 | | 5162-451-002 | | 5163-451-002 | |
| | 90 volts DC | 5161-451-003 | | 5162-451-003 | | 5163-451-003 | |
| | 24 volts DC | 5161-451-004 | | 5162-451-004 | | 5163-451-004 | |
| *11 | Retainer Ring | 748-0018 | 1 | 748-0727 | 1 | 748-0737 | 1 |
| 12 | Adapter | | | | | 104-0300 | 2 |
| 13 | Screw | | | | | 797-1396 | 4 |
| 14 | Lockwasher | | | | | 950-0102 | 4 |
| Optional Accessory Items | | | | | | | |
| 15 | Conduit box 100-1 | 5162-101-002 | 1 | 5162-101-002 | 1 | 5162-101-002 | 1 |
| 16 | Restraining Arm Assembly | 5162-101-004 | 1 | 5162-101-004 | 1 | 5163-101-004 | 1 |
| Kit Items | | | | | | | |
| | * Clutch Rebuild Kit | 5161-101-011 | 1 | 5162-101-011 | 1 | 5163-101-011 | 1 |
| (includes items 7-1, 7-2, 7-3, 7-4, 8, 9, 11) | | | | | | | |
| Note: In some versions of this product, item 8 consists of a one (1) piece rotor. | | | | | | | |
| | Friction Face Replacement Kit | 5161-101-007 | | 5162-101-007 | | 5163-101-007 | |
| For Clutches with Replaceable Friction Face Only | | | | | | | |
| Mounting Accessory Kits (not shown) | | | | | | | |
| 1 | 1/2" Bore - 3/4" Bore | 5161-101-001 | | | | | |
| 1-1 | Ring Retainer Ext. | 748-0734 | 1 | | | | |
| 1-2 | Wire Retainer | 742-0027 | 1 | | | | |
| 1-3 | Key | 590-0104 | 1 | | | | |
| 1-4 | Setscrew | 797-1393 | 2 | | | | |
| 1 | 7/8" Bore | 5161-101-002 | | | | | |
| 1-1 | Ring Retainer Ext. | 748-0734 | 1 | | | | |
| 1-2 | Wire Retainer | 742-0027 | 1 | | | | |
| 1-3 | Key | 590-0104 | 1 | | | | |
| 1-4 | Collar and Setscrew | 266-0031 | 1 | | | | |
| 1 | 3/4" Bore - 1" Bore | | | 5162-101-001 | | | |
| 1-1 | Ring Retainer Ext. | | | 748-0725 | 1 | | |
| 1-2 | Wire Retainer | | | 742-0026 | 1 | | |
| 1-3 | Key | | | 590-0103 | 1 | | |
| 1-4 | Setscrew | | | 797-1386 | 2 | | |
| 1 | 1-1/8" Bore | | | 5162-101-010 | | | |
| 1-1 | Ring Retainer Ext. | | | 748-0725 | 1 | | |
| 1-2 | Wire Retainer | | | 742-0026 | 1 | | |
| 1-3 | Key | | | 590-0103 | 1 | | |
| 1-4 | Setscrew | | | 797-1077 | 2 | | |
| 1-5 | Collar | | | 266-0032 | 1 | | |
| 1 | All bore sizes | | | | | 5163-101-001 | |
| 1-1 | Ring Retainer Ext. | | | | | 748-0738 | 1 |
| 1-2 | Wire Retainer | | | | | 742-0026 | 1 |
| 1-3 | Key | | | | | 590-0105 | 1 |
| 1-4 | Setscrew | | | | | 797-1395 | 2 |

ATB Series AT Brake

ATB-25, ATB-55, ATB-115



Electrical and Mechanical Data

| Model Size | Voltage DC | Unit | Resistance (Ohms) | Current (Amps) | Watts | Coil Build Up (MMS) | Coil Decay (MMS) | Inertia*—WR ² (lb.ft. ²) | Max. RPM | Weight lbs. |
|------------|------------|-------|-------------------|----------------|-------|---------------------|------------------|---|----------|-------------|
| 25 | 6 | Brake | 1.37 | 4.38 | 26.3 | 145 | 9 | .048 | 3600 | 8 |
| | 24 | | 20.2 | 1.19 | 28.6 | 145 | 9 | .048 | 3600 | 8 |
| | 90 | | 290 | .31 | 27.9 | 145 | 9 | .048 | 3600 | 8 |
| 55 | 6 | Brake | 1.21 | 4.96 | 29.8 | 210 | 35 | .173 | 3600 | 18 |
| | 24 | | 19.6 | 1.22 | 29.3 | 210 | 35 | .173 | 3600 | 18 |
| | 90 | | 230 | .39 | 35.2 | 210 | 35 | .173 | 3600 | 18 |
| 115 | 6 | Brake | 1.02 | 5.91 | 35.4 | 150 | 45 | .483 | 3600 | 28 |
| | 24 | | 16.5 | 1.46 | 35 | 150 | 45 | .483 | 3600 | 28 |
| | 90 | | 182 | .50 | 44.6 | 150 | 45 | .483 | 3600 | 28 |

Service Parts

ATB Series AT Brake

ATB-25, ATB-55, ATB-115

Component Parts

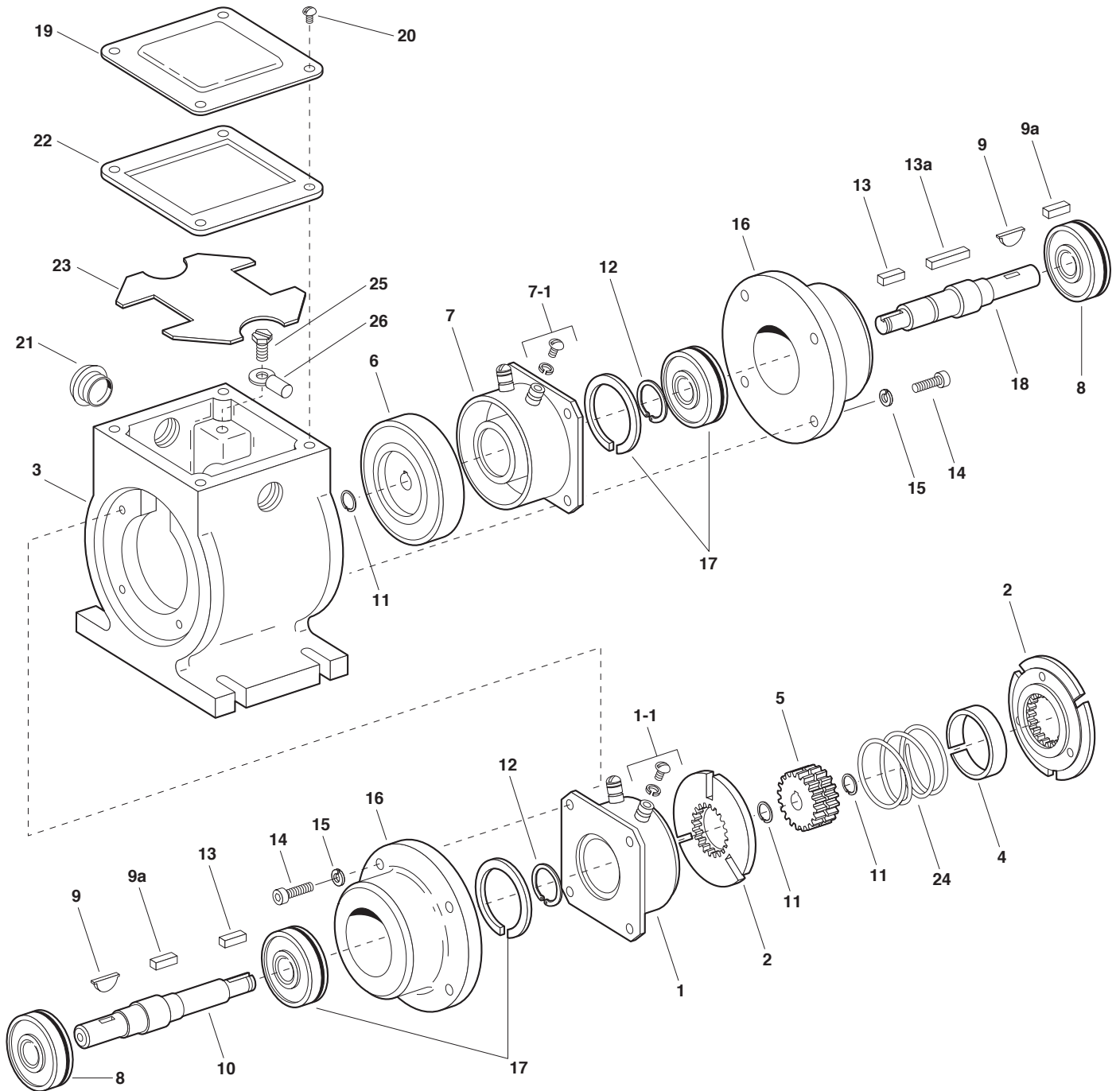
| Item | Description | ATB-25 | | ATB-55 | | ATB-115 | |
|---------------------------------|--|--------------|------|--------------|----------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| †1 | Retainer | 748-0018 | 1 | 748-0727 | 1 | 748-0737 | 1 |
| †2 | Screw | 797-0321 | 3 | 797-0321 | 4 | 797-0321 | 4 |
| 3 | Plate | 686-0166 | 1 | 686-0162 | 1 | 686-0171 | 1 |
| †4 | Wave Spring | 808-0404 | 1 | 808-0401 | 1 | 808-0384 | 2 |
| †5 | Detent Ring | 748-2031 | 1 | 748-2038 | 1 | 748-2020 | 1 |
| 6 | Armature Hub | 540-0908 | 1 | 540-0851 | 1 | 540-0864 | 1 |
| *†7-1 | Armature | 110-0220 | 1 | 110-0218 | 1 | 110-0223 | 1 |
| *†7-2 | Facing Assembly | 5161-445-003 | 1 | 5162-445-003 | 1 | 5163-445-003 | 1 |
| *†7-3 | Screw | 797-1389 | 6 | 797-1389 | 8 | 797-1389 | 8 |
| *†7-4 | Screw | 797-1519 | 4 | 797-1462 | 6 | 797-1463 | 6 |
| *†7-5 | Lockwasher | 950-0436 | 4 | 950-0355 | 4 | 950-0355 | 6 |
| *†7-6 | Flatwasher | | | 950-0023 | 2 | 950-0023 | 2 |
| 8 | Magnet Assembly | | 1 | | 1 | | 1 |
| | 6 volts DC | 5191-631-002 | | 5192-631-002 | | 5193-631-002 | |
| | 24 volts DC | 5191-631-004 | | 5192-631-004 | | 5193-631-004 | |
| | 90 volts DC | 5191-631-003 | | 5192-631-003 | | 5193-631-003 | |
| †9 | Setscrew | 797-1393 | 2 | 797-1386 | 2 | 797-1395 | 2 |
| 10 | Splined Hub | | 1 | | 1 | | 1 |
| | 1/2" Bore | 540-0901 | | | | | |
| | 5/8" Bore | 540-0902 | | | | | |
| | 3/4" Bore | 540-0903 | | 540-1512 | | | |
| | 7/8" Bore | 540-0904 | | 540-1513 | | | |
| | 1" Bore | | | 540-1514 | | | |
| | 1-1/8" Bore | | | 540-1515 | | 540-0866 | |
| | 1-1/4" Bore | | | | | 540-0867 | |
| 1-3/8" Bore | | | | | 540-0868 | | |
| | 1-1/2" Bore | | | | | 540-0869 | |
| †11 | Ball Bearing | 166-0283 | 1 | 166-0277 | 1 | 166-0279 | 1 |
| †12 | Retainer Ring | 748-0018 | 1 | 748-0276 | 1 | 748-0737 | 1 |
| 13 | Shim | 801-1035 | 1 | 801-1034 | 1 | 801-1036 | 1 |
| 14 | Backplate | 686-0167 | 1 | 686-0163 | 1 | 686-0172 | 1 |
| †15 | Screw | 797-1392 | 4 | 797-0437 | 3 | 797-0447 | 3 |
| Optional Accessory Items | | | | | | | |
| 16 | Conduit box | 5162-101-002 | 1 | 5162-101-002 | 1 | 5162-101-002 | 1 |
| 17 | Torque Arm | 5191-101-001 | 1 | 5192-101-001 | 1 | 5193-101-001 | 1 |
| Kit Items | | | | | | | |
| *†18 | Friction Face Replacement Kit (includes items 7-1, 7-2, 7-3, 7-4, 7-5, 7-6) | 5161-101-007 | 1 | 5162-101-007 | 1 | 5163-101-007 | 1 |
| †19 | Brake Rebuild Kit (includes items, 1, 2, 4, 5, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 9, 11, 12, 15) | 5191-101-006 | 1 | 5192-101-006 | 1 | 5193-101-006 | 1 |

Refer to Service Manual P-218.

Service Parts

EP Series Electro Pack

EP-170, EP-250, EP-400



Service Parts

Component Parts

| Item | Description | EP-170 | | EP-250 | | EP-400 | |
|------|-----------------------------------|--------------|------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. | Part No. | Qty. |
| 1 | Magnet Assembly | | 1 | | 1 | | 1 |
| | 6 volt | 5375-631-003 | | 5319-631-002 | | 5115-631-002 | |
| | 24 volt | 5375-631-005 | | 5319-631-003 | | 5115-631-003 | |
| | 90 volt | 5375-631-007 | | 5319-631-005 | | 5115-631-004 | |
| 1-1 | Terminal Accessory | † | | 5103-101-002 | 1 | 5103-101-002 | 1 |
| 2 | Armature Assembly with Autogap | 110-0111 | 2 | 5130-111-008 | 2 | 5131-111-001 | 2 |
| 3 | Housing | 535-0079 | 1 | 535-0082 | 1 | 535-0083 | 1 |
| 4 | Armature Spacer | 807-1021 | 1 | | | | |
| 5 | Splined Armature Hub | 540-1250 | 1 | 540-1635 | 1 | 540-2034 | 1 |
| 6 | Rotor Assembly | 5603-751-029 | 1 | 5103-751-010 | 1 | 5104-751-034 | 1 |
| 7 | Field Assembly | | 1 | | 1 | | 1 |
| | 6 volt | 5603-451-047 | | 5103-451-002 | | 5104-451-032 | |
| | 24 volt | 5603-451-049 | | 5103-451-004 | | 5104-451-033 | |
| | 90 volt | 5603-451-051 | | 5103-451-007 | | 5104-451-034 | |
| 7-1 | Terminal Accessory | † | | 5103-101-002 | 1 | 5103-101-002 | 1 |
| 8 | Ball Bearing | 166-0112 | 2 | 166-0114 | 2 | 166-0116 | 2 |
| 9 | Key | 590-0095 | 2 | 590-0014 | 2 | | |
| 9a | Key | | | | | 590-0016 | 2 |
| 10 | Shaft, Brake | 798-0136 | 1 | 798-0133 | 1 | 798-0131 | 1 |
| 11 | Retainer Ring | 748-0346 | 2 | 748-0347 | 2 | 748-0348 | 2 |
| 12 | Retainer Ring | 748-0042 | 2 | 748-0024 | 2 | 748-0022 | 2 |
| 13 | Key | 590-0089 | 2 | 590-0088 | 2 | 590-0087 | 1 |
| 13a | Key | | | | | 590-0106 | 1 |
| 14 | Capscrew | 797-1219 | 8 | 797-1219 | 8 | 797-1220 | 8 |
| 15 | Lockwasher | 950-0351 | 8 | 950-0351 | 8 | 950-0355 | 8 |
| 16 | Bearing Housing | 535-0080 | 2 | 535-0081 | 2 | 535-0084 | 2 |
| 17 | Ball Bearing, with Retainer | 166-0111 | 2 | 166-0113 | 2 | 166-0115 | 2 |
| 18 | Shaft, Clutch | 798-0135 | 1 | 798-0134 | 1 | 798-0132 | 1 |
| 19 | Cover Plate | 686-1017 | 1 | 686-1018 | 1 | 686-1019 | 1 |
| 20 | Screw | 797-0015 | 4 | 797-0015 | 4 | 797-0015 | 4 |
| 21 | Dust Plug | 680-0037 | 2 | 680-0037 | 2 | 680-0037 | 2 |
| 22 | Gasket | 495-0003 | 1 | 495-0004 | 1 | 495-0005 | 1 |
| 23 | Insulator | 572-0573 | 1 | 572-0572 | 1 | 572-0574 | 1 |
| 24 | Vertical Mfg. Spring Kit Optional | 5603-101-001 | 1 | 5103-101-006 | 1 | 5104-101-005 | 1 |
| 25 | Ground Screw | | 1 | 797-1245 | 1 | 797-1245 | 1 |
| 26 | Terminal | | 1 | 900-0116 | 1 | 900-0016 | 1 |

†Lead wires used on EP-170.

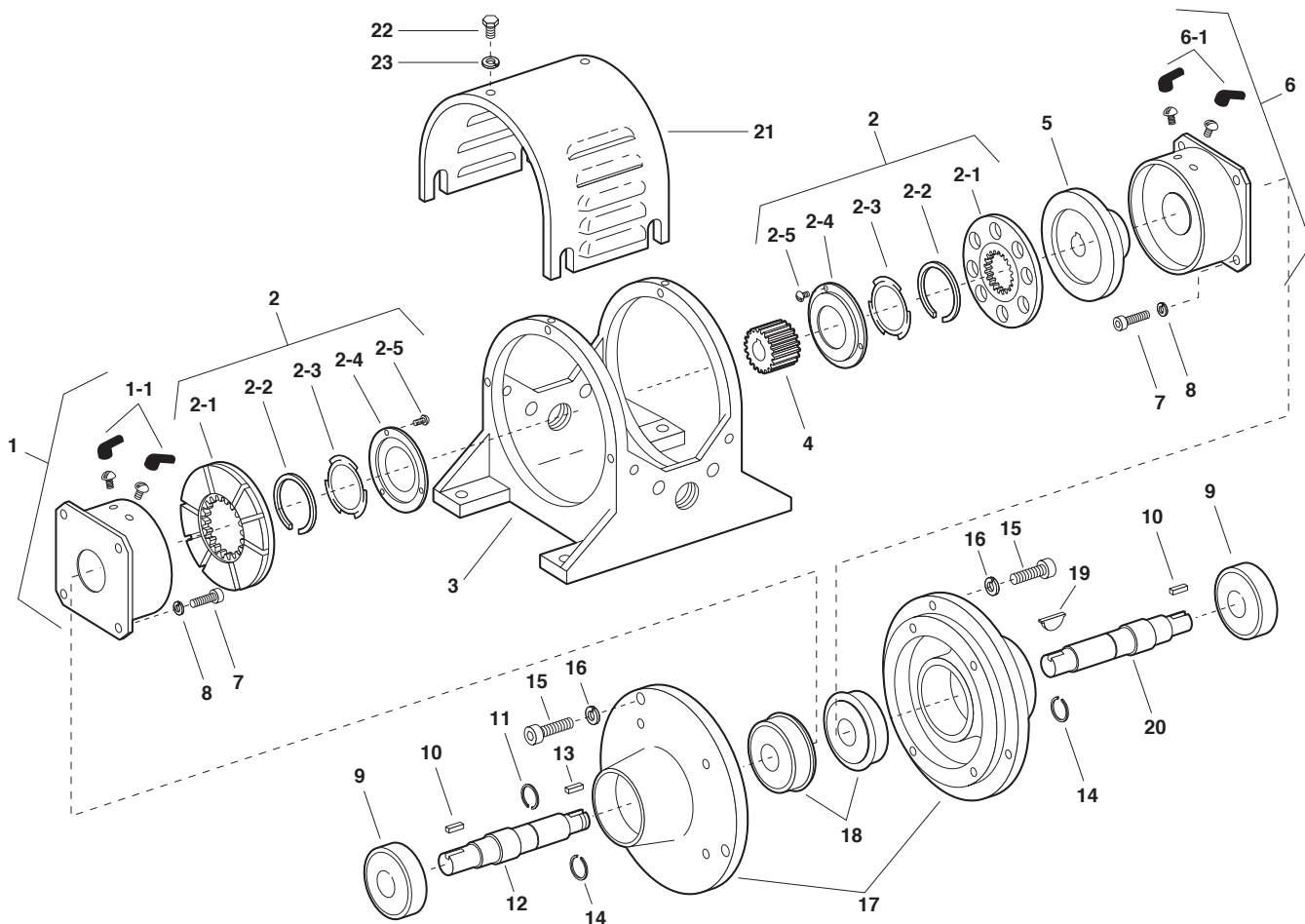
These units meet the standards of UL508 and are listed under guide card #NMTR, file #59164.



Service Parts

EP Series Electro Pack

EP-500



Component Parts

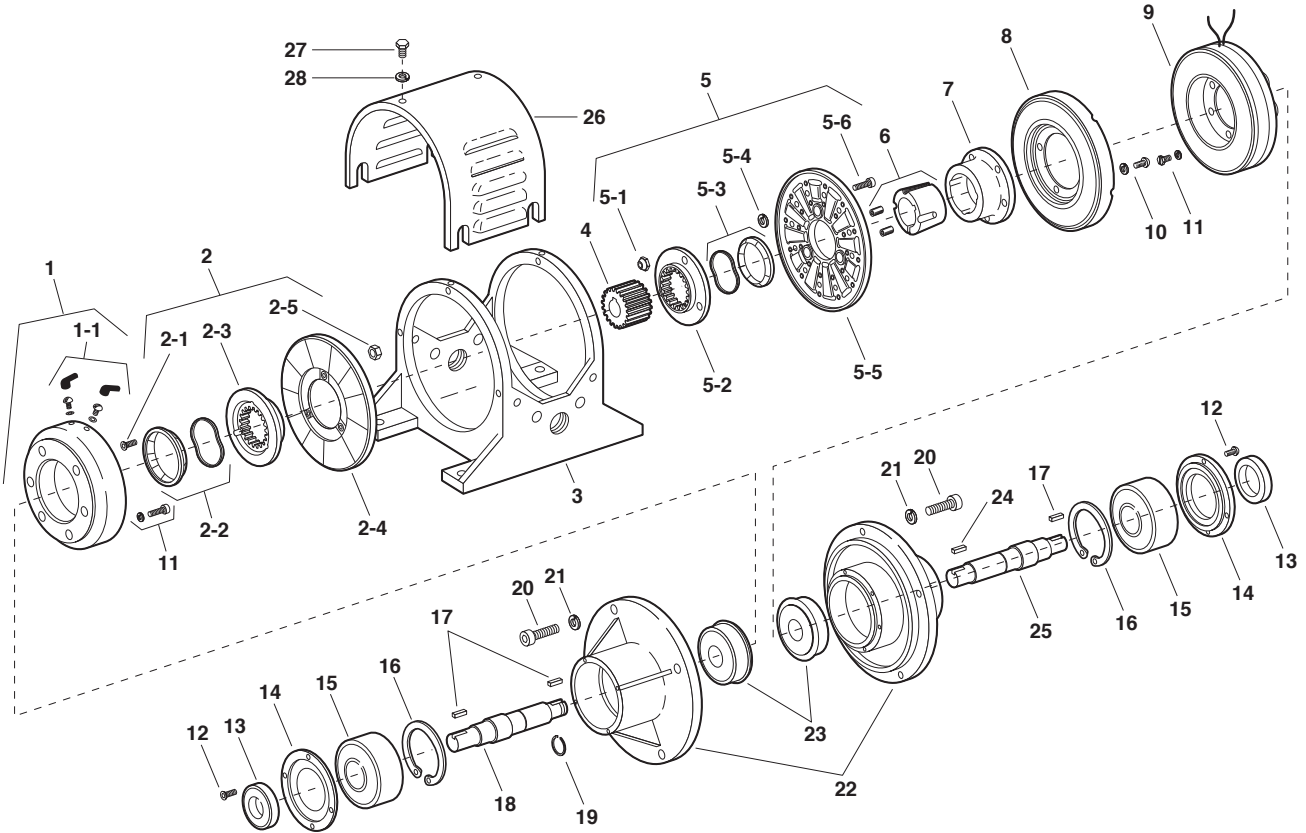
| Item | Description | Part No. | Qty. |
|------|--------------------|------------------------------|------|
| 1 | Magnet Assembly | | 1 |
| | 6 volt | 5300-631-009 | |
| | 24 volt | 5300-631-010 | |
| | 90 volt | 5300-631-011 | |
| 1-1 | Terminal Accessory | 5311-101-001 | 1 |
| 2 | Armature Assembly | 5230-111-002 | 2 |
| 2-1 | Armature | 5230-111-001 | 2 |
| 2-2 | Retainer Ring | 748-0355 | 2 |
| 2-3 | Spring | 808-0412 | 2 |
| 2-4 | Retainer Plate | 748-0364 | 2 |
| 2-5 | Screw | 797-0028 | 12 |
| 3 | Mounting Frame | 174-0028 | 1 |
| 4 | Spined Hub | 540-2035 | 1 |
| 5 | Rotor | 5230-751-001 | 1 |
| 6 | Field | | 1 |
| | 6 volt | 5230-451-003 | |
| | 24 volt 90 volt | 5230-451-005 5230-451-002 | |

Refer to Service Manual P-212.
These units meet the standards of UL508 and are listed under guide card #NMTR, file #59164.



| Item | Description | Part No. | Qty. |
|------|--------------------|--------------|------|
| 6-1 | Terminal Accessory | 5311-101-001 | 1 |
| 7 | Capscrew | 797-0416 | 8 |
| 8 | Lockwasher | 950-0107 | 8 |
| 9 | Ball Bearing | 166-0125 | 2 |
| 10 | Key | 590-0020 | 2 |
| 11 | Retainer Ring | 748-0361 | 1 |
| 12 | Shaft, Brake | 798-0022 | 1 |
| 13 | Key | 590-0022 | 1 |
| 14 | Retainer Ring | 748-0335 | 2 |
| 15 | Capscrew | 797-0418 | 8 |
| 16 | Lockwasher | 950-0107 | 8 |
| 17 | Endbell Housing | 535-0010 | 2 |
| 18 | Ball Bearing | 166-0127 | 2 |
| 19 | Key | 590-0021 | 1 |
| 20 | Shaft, Clutch | 798-0023 | 1 |
| 21 | Cover Drip Proof | 287-0068 | 1 |
| 22 | Capscrew | 797-1214 | 6 |
| 23 | Lockwasher | 950-0102 | 6 |

Service Parts



Component Parts

| Item | Description | Part No. | Qty. |
|------|-------------------------------------|--------------|------|
| 1 | Magnet Assembly | | 1 |
| | 6 volt | 5311-631-002 | |
| | 24 volt | 5311-631-003 | |
| | 90 volt | 5311-631-004 | |
| 1-1 | Terminal Accessory | 5311-101-001 | 1 |
| 2 | Armature Assembly & Splined Adapter | 5321-111-001 | 1 |
| 2-1 | Screw | 797-0272 | 3 |
| 2-2 | Autogap Accessory | 5321-101-006 | 1 |
| 2-3 | Splined Adapter | 104-0008 | 1 |
| 2-4 | Armature | 5321-111-022 | 1 |
| 2-5 | Locknut | 661-0004 | 3 |
| 3 | Frame | 174-0019 | 1 |
| 4 | Splined Hub | 540-0320 | 1 |
| 5 | Armature & Splined Adapter | 5201-111-001 | 1 |
| 5-1 | Locknut | 661-0004 | 3 |
| 5-2 | Splined Adapter | 104-0008 | 1 |
| 5-3 | Autogap Accessory | 5321-101-006 | 1 |
| 5-4 | Spacer | 748-0333 | 3 |
| 5-5 | Armature | 5321-111-022 | 1 |
| 5-6 | Screw | 797-0341 | 3 |
| 6 | Bushing, 1-1/4" Bore | 180-0113 | 1 |
| 7 | Rotor Hub | 540-0013 | 1 |
| 8 | Rotor | 5201-751-003 | 1 |
| 9 | Field | | 1 |
| | 6 volt | 5201-451-006 | |
| | 24 volt | 5201-451-008 | |
| | 90 volt | 5201-451-010 | |

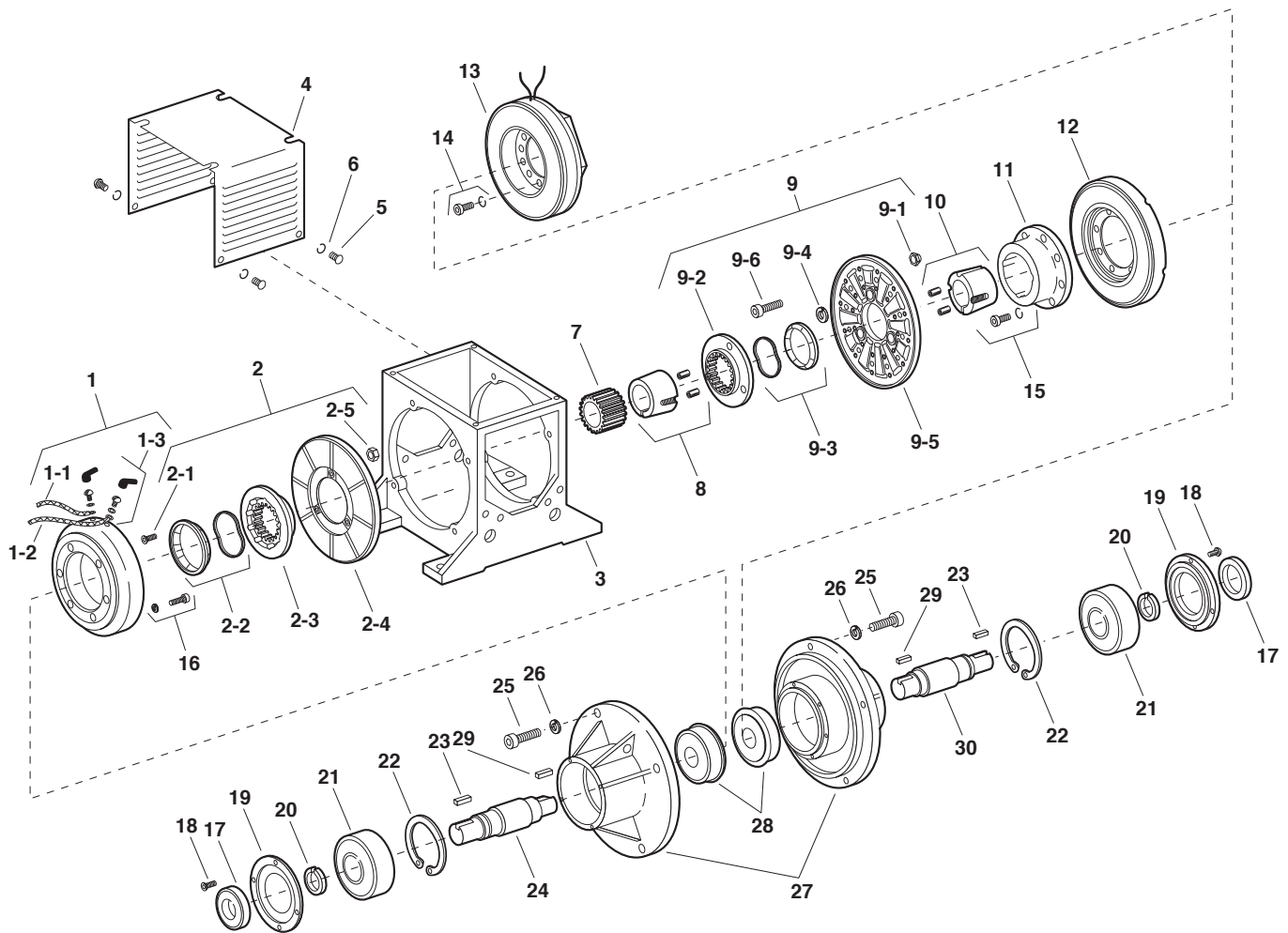
| Item | Description | Part No. | Qty. |
|------|--------------------|--------------|------|
| 10 | Mounting Accessory | 5201-101-007 | 1 |
| 11 | Mounting Accessory | 5321-101-001 | 2 |
| 12 | Screw | 797-1008 | 8 |
| 13 | Oil Seal | 795-0023 | 2 |
| 14 | Retainer Plate | 686-0031 | 2 |
| 15 | Ball Bearing | 166-0126 | 2 |
| 16 | Retainer Ring | 748-0336 | 2 |
| 17 | Key | 590-0019 | 3 |
| 18 | Shaft, Brake | 798-0019 | 1 |
| 19 | Retainer Ring | 748-0335 | 1 |
| 20 | Capscrew | 797-0351 | 8 |
| 21 | Lockwasher | 950-0354 | 8 |
| 22 | Endbell Housing | 535-0005 | 2 |
| 23 | Ball Bearing | 166-0125 | 2 |
| 24 | Key | 590-0018 | 1 |
| 25 | Shaft, Clutch | 798-0020 | 1 |
| 26 | Cover, Drip Proof | 287-0069 | 1 |
| 27 | Capscrew | 797-1214 | 6 |
| 28 | Lockwasher | 540-0102 | 6 |

Refer to Service Manual P-212.
 These units meet the standards of UL508 and are listed under guide card #NMTR, file #59164.



EP Series Electro Pack

EP-1000



Service Parts

Component Parts

| Item | Description | Part No. | Qty. |
|------------|----------------------------|--------------|------|
| 1 | Magnet Assembly | | 1 |
| | 6 volt | 5312-631-004 | |
| | 24 volt | 5312-631-005 | |
| | 90 volt | 5312-631-006 | |
| 1-1 | Wire Assembly | 5232-954-003 | 1 |
| 1-2 | Wire Assembly | 5232-954-004 | 1 |
| 1-3 | Terminal Accessory | 5311-101-001 | 1 |
| 2 | Armature & Splined Adapter | 5322-111-002 | 1 |
| 2-1 | Button Head Screw | 797-0272 | 1 |
| 2-2 | Autocap Accessory | 5322-101-004 | 1 |
| 2-3 | Splined Arm, Adapter | 104-0009 | 1 |
| 2-4 | Armature | 5322-111-036 | 1 |
| 2-5 | Locknut | 661-0004 | 3 |
| 3 | Frame | 174-0043 | 1 |
| 4 | Dust Cover | 287-0052 | 1 |
| 5 | Button Head Screw | 797-1175 | 8 |
| 6 | Lockwasher | 950-0103 | 8 |
| 7 | Splined Armature Hub | 540-0061 | 1 |
| 8 | Bushing, 1-7/8" Bore | 180-0177 | 1 |
| 9 | Armature & Splined Adapter | 5202-111-001 | 1 |
| 9-1 | Locknut | 661-0004 | 3 |
| 9-2 | Splined Armature Adapter | 104-0009 | 1 |
| 9-3 | Autogap Accessory | 5322-101-004 | 1 |
| 9-4 | Spacer | 748-0333 | 3 |
| 9-5 | Armature | 5322-111-036 | 1 |

Refer to Service Manual P-212.

These units meet the standards of UL508 and are listed under guide card #NMTR, file #59164.

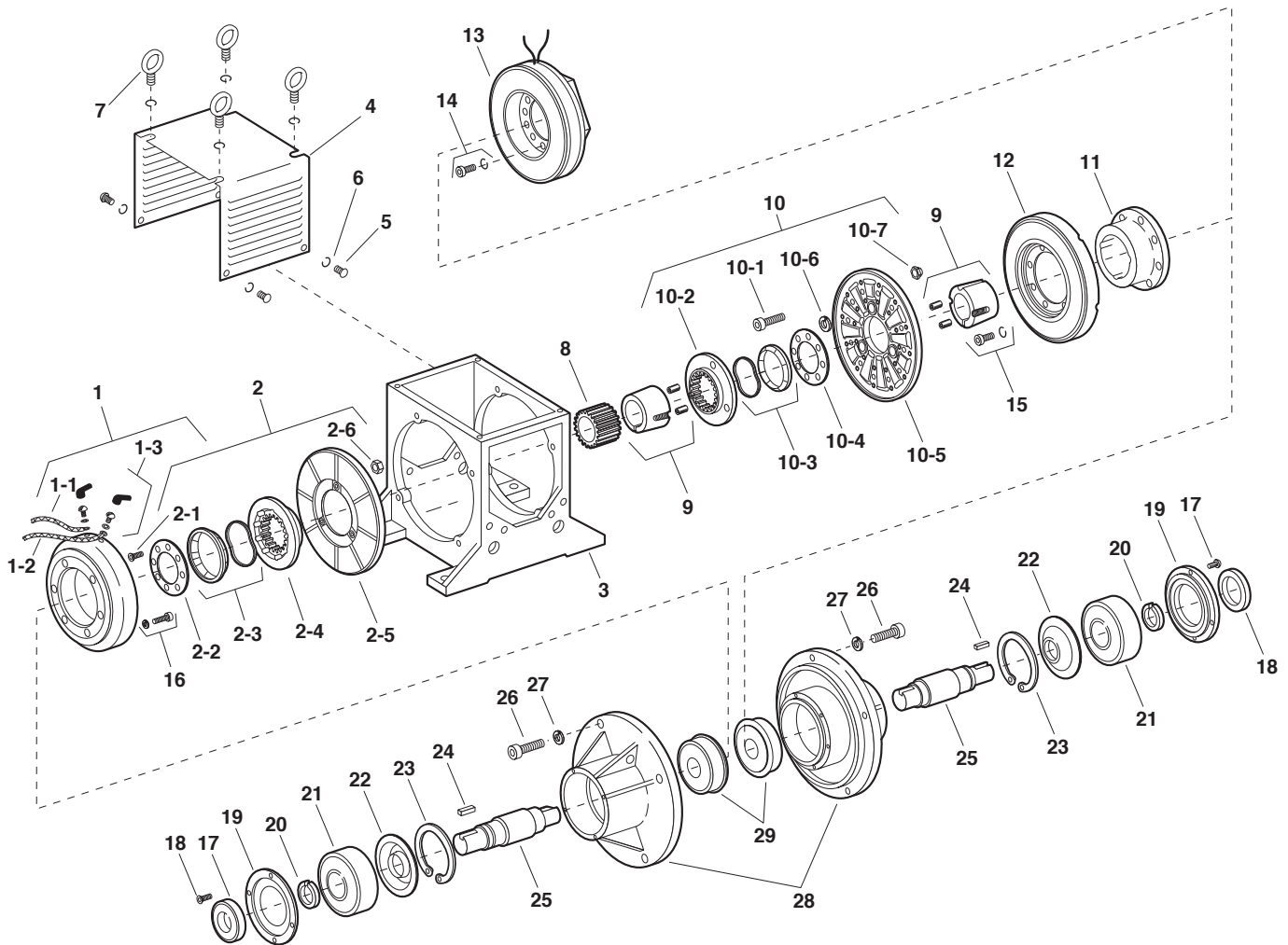


| Item | Description | Part No. | Qty. |
|------------|--------------------------|--------------|------|
| 9-6 | Capscrew | 797-0341 | 3 |
| 10 | Bushing, 2" Bore | 180-0179 | 1 |
| 11 | Rotor Hub | 540-0315 | 1 |
| 12 | Rotor | 5202-751-003 | 1 |
| 13 | Field Assembly | | 1 |
| | 6 volt | 5202-451-004 | |
| | 24 volt | 5202-451-006 | |
| | 90 volt | 5202-451-007 | |
| 14 | Mounting Accessory | 5321-101-001 | 1 |
| 15 | Mounting Accessory | 5201-101-007 | 1 |
| 16 | Mounting Accessory | 5321-101-001 | 1 |
| 17 | Oil Seal | 795-0024 | 2 |
| 18 | Button Head Screw | 797-1008 | 8 |
| 19 | Retainer Plate | 686-0047 | 2 |
| 20 | Retainer Ring – External | 748-0504 | 2 |
| 21 | Ball Bearing | 166-0130 | 2 |
| 22 | Retainer Ring – Internal | 748-0375 | 2 |
| 23 | Key | 590-0024 | 2 |
| 24 | Shaft, Brake | 798-0026 | 1 |
| 25 | Capscrew | 797-0361 | 8 |
| 26 | Lockwasher | 950-0362 | 8 |
| 27 | Bearing Housing | 535-0012 | 2 |
| 28 | Ball Bearing | 166-0131 | 2 |
| 29 | Key | 590-0025 | 2 |
| 30 | Shaft, Clutch | 798-0025 | 1 |

Service Parts

EP Series Electro Pack

EP-1525, EP-1525HT



Service Parts

Component Parts

| Item | Description | EP-1525 | | EP-1525HT | |
|-------|----------------------------|--------------|------|--------------|------|
| | | Part No. | Qty. | Part No. | Qty. |
| 1 | Magnet | | 1 | | 1 |
| | 6 volt | 5314-631-004 | | | |
| | 24 volt | | | 5314-631-006 | |
| | 90 volt | 5314-631-005 | | 5314-631-005 | |
| *1-1 | Wire Assembly | 5232-954-003 | 1 | 5232-954-003 | 1 |
| *1-2 | Wire Assembly | 5232-954-004 | 1 | 5232-954-004 | 1 |
| *1-3 | Terminal Accessory | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 2 | Armature & Splined Adapter | 5324-111-001 | 1 | 5324-111-001 | 1 |
| *2-1 | Button Head Screw | 797-0272 | 8 | 797-0272 | 8 |
| *2-2 | Armature Plate | 686-0003 | 1 | 686-0003 | 1 |
| *2-3 | Autogap Accessory | 5323-101-002 | 1 | 5323-101-002 | 1 |
| *2-4 | Splined Armature Adapter | 104-0011 | 1 | 104-0011 | 1 |
| *2-5 | Armature | 5324-111-034 | 1 | 5324-111-034 | 1 |
| *2-6 | Locknut | 661-0004 | 8 | 661-0004 | 8 |
| 3 | Frame | 174-0044 | 1 | 174-0044 | 1 |
| 4 | Dust Cover | 287-0040 | 1 | 287-1002 | 1 |
| 5 | Button Head Screw | 797-1175 | 8 | 797-1175 | 8 |
| 6 | Lock Washer | 950-0103 | 8 | 950-0103 | 8 |
| 7 | Eye Bolts | 171-0006 | 4 | 171-0006 | 4 |
| 8 | Splined Armature Hub | 540-0063 | 1 | 540-0063 | 1 |
| 9 | Bushing, 2-3/8" Bore | 180-0215 | 2 | 180-0215 | 2 |
| 10 | Armature & Splined Adatper | 5204-111-004 | 1 | 5204-111-004 | 1 |
| *10-1 | Capscrew | 797-0342 | 8 | 797-0342 | 8 |
| *10-2 | Splined Armature Adapter | 104-0011 | 1 | 104-0011 | 1 |
| *10-3 | Autogap Accessory | 5323-101-002 | 1 | 5323-101-002 | 1 |
| *10-4 | Retainer Plate | 686-0003 | 1 | 686-0003 | 1 |
| *10-5 | Armature | 5324-111-034 | 1 | 5324-111-034 | 1 |
| *10-6 | Spacer | 748-0333 | 8 | 748-0333 | 8 |
| *10-7 | Locknut | 661-0004 | 8 | 661-0004 | 8 |
| 11 | Rotor Hub | 5234-541-001 | 1 | 5234-541-001 | 1 |
| 12 | Rotor | 5204-751-002 | 1 | 5204-751-001 | 1 |
| 13 | Field Assembly | | 1 | | 1 |
| | 6 volt | 5204-451-013 | | | |
| | 24 volt | | | 5204-451-066 | |
| | 90 volt | 5204-451-016 | | 5204-451-006 | |
| 14 | Mounting Accessory | 5321-101-002 | 2 | 5321-101-002 | 2 |
| 15 | Mounting Accessory | 5321-101-001 | 2 | 5321-101-001 | 2 |
| 16 | Mounting Accessory | 5321-101-001 | 2 | 5321-101-001 | 2 |
| 17 | Screw | 797-0294 | 8 | 797-0294 | 8 |
| 18 | Oil Seal | 795-0025 | 2 | 795-0025 | 2 |
| 19 | Retainer Plate | 686-0048 | 2 | 686-0048 | 2 |
| 20 | Retaining Ring – External | 748-0503 | 2 | 748-0503 | 2 |
| 21 | Ball Bearing | 166-0132 | 2 | 166-0132 | 2 |
| 22 | Bearing Seal | 795-0036 | 2 | 795-0036 | 2 |
| 23 | Retainer Ring – Internal | 748-0552 | 2 | 748-0052 | 2 |
| 24 | Key | 590-0028 | 2 | 590-0028 | 2 |
| 25 | Shaft | 798-0027 | 2 | 798-0027 | 2 |
| 26 | Capscrew | 797-0362 | 12 | 797-0362 | 12 |
| 27 | Lock Washer | 950-0362 | 12 | 950-0362 | 12 |
| 28 | Bearing Housing | 535-0013 | 2 | 535-0013 | 2 |
| 29 | Ball Bearing | 166-0133 | 2 | 166-0133 | 2 |

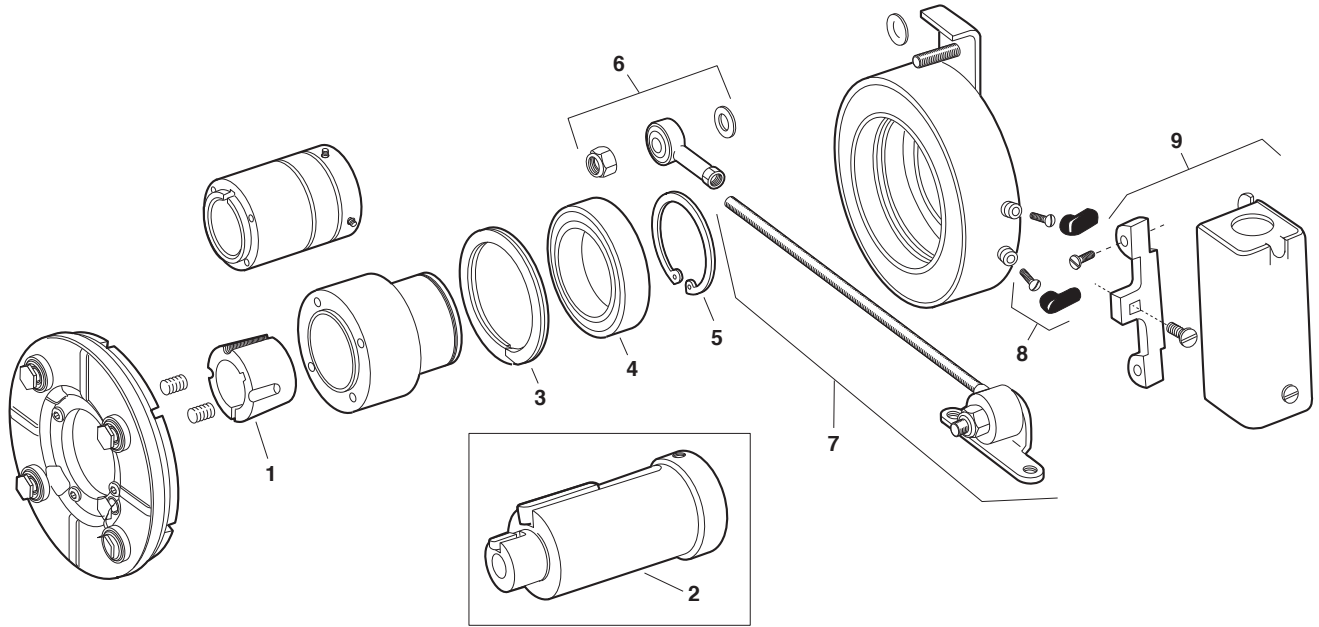
*Shipped Assembled
Refer to Service Manual P-212.
These units meet the standards of UL508 and are listed under guide card #NMTR, file #59164.



Service Parts

Permanent Magnet Electrically Released Brakes

FB-375, FB-475, FB-650



Service Parts

FB Series Electrically Released Brakes

FB-375, FB-475, FB-650

Component Parts

| Item | Description | FB-375 | | FB-475 | | FB-650 | |
|-----------------------|---------------------------|--------------|-----|---|-----|---|-----|
| | | Part Number | Qty | Part Number | Qty | Part Number | Qty |
| Optional Parts | | | | | | | |
| 1 | *Bushing | N/A | | 180-0410 1/2" bore to 180-0418 1" bore | 1 | 180-0421 1/2" bore to 180-0435 1-3/8" bore | 1 |
| | Adapter (optional) | | 1 | | 1 | | 1 |
| | 5/8" motor shaft | 5380-101-005 | | | | | |
| | 7/8" motor shaft | 5380-101-004 | | | | | |
| 2 | 1-1/8" motor shaft | | | 5381-101-003 | | 5382-101-003 | |
| | 1-3/8" motor shaft | | | | | 5382-101-002 | |
| | 1-5/8" motor shaft | | | | | | |
| Service Parts | | | | | | | |
| 3 | Retainer ring | 748-0101 | 1 | 748-0102 | 1 | 748-0104 | 1 |
| 4 | Ball bearing | 166-0150 | 1 | 166-0110 | 1 | 166-0104 | 1 |
| 5 | Retainer ring | 748-0018 | 1 | 748-0002 | 1 | 748-0004 | 1 |
| 6 | Torque arm mount assembly | 5380-101-007 | 1 | 5381-101-006 | 1 | 5382-101-007 | 1 |
| 7 | Torque arm rod assembly | 5380-112-001 | 1 | 5381-112-001 | 1 | 5382-112-001 | 1 |
| 8 | Terminal accessory | 5311-101-001 | 1 | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 9 | Conduit Box | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 |

*See page 198 for specific part numbers.

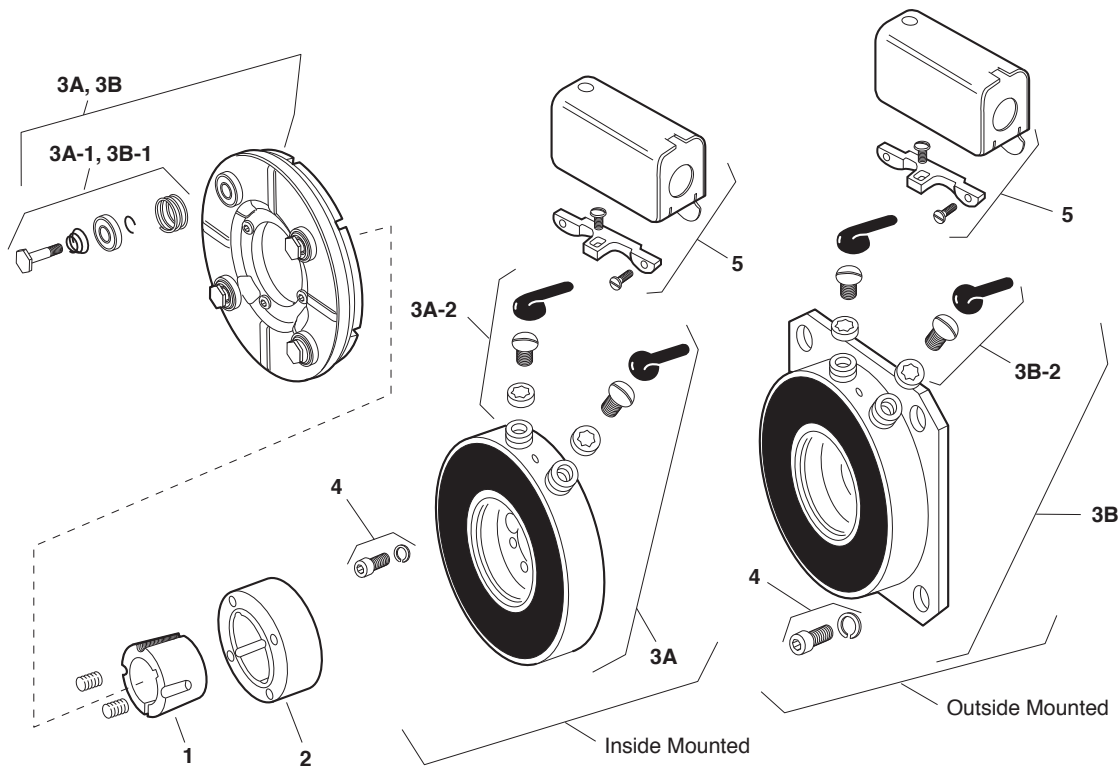
These units, when used with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR2, file #59164. Magnet and armature are not field replaceable.



Service Parts

ER Series Electrically Released Brakes

ER-375, ER-475, ER-650



Component Parts

| Item | Description | ER-375 | | ER-475 | | ER-650 | |
|------|---|--------------|-----|------------------------------------|-----|--|-----|
| | | Part Number | Qty | Part Number | Qty | Part Number | Qty |
| 1 | †Bushing | | | 180-0410-0418 (1/2" to 1" Bore) | 1 | 180-0421-0435 (1/2" to 1-3/8" Bore) | 1 |
| 2 | Hub | | | 540-0849 | 1 | 540-0848 | 1 |
| | 1/2" Bore | 540-0846 | 1 | | | | |
| | 5/8" Bore | 540-0847 | 1 | | | | |
| 3A | Magnet and Armature (Inside Mounted, 90 Volt) Sold only in matched pairs* | | | 5255-5 | 1 | 5256-6 | 1 |
| 3A-1 | Autogap Accessory | | | 5391-101-003 | 4 | 5392-101-003 | 4 |
| 3A-2 | Terminal Accessory | | | 5103-101-002 | 1 | 5103-101-002 | 1 |
| 3B | Magnet and Armature (Outside Mounted, 90 Volt) Sold only in matched pairs* | 5254-1 | 1 | 5255-6 | 1 | 5256-7 | 1 |
| 3B-1 | Autogap Accessory | 5390-101-002 | 3 | 5391-101-003 | 4 | 5392-101-003 | 1 |
| 3B-2 | Terminal Accessory | 5103-101-002 | 1 | 5103-101-002 | 1 | 5103-101-002 | 1 |
| 4 | Mounting Accessory | | | | | | |
| | Inside Mount | | | 5255-101-001 | 1 | 5256-101-003 | 1 |
| | Outside Mount | 5254-101-002 | 1 | 5255-101-002 | 1 | 5256-101-003 | 1 |
| 5 | Conduit Box | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 |

† See page 198 for specific part numbers.

* Magnets and armatures sold only in pre-burnished sets to assure rated torque available upon installation.

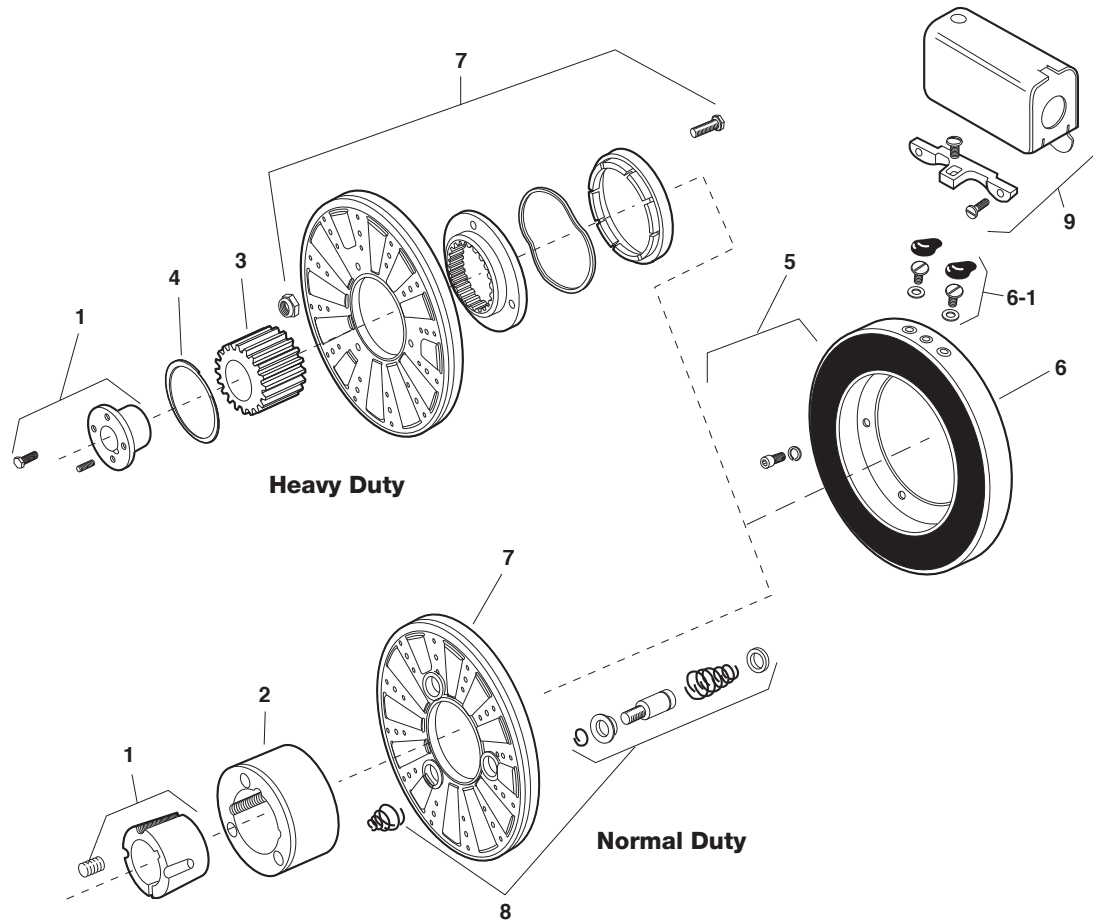
These units, when used with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR2, file #59164.



Service Parts

ER Series Electrically Released Brakes

ER-825, ER-1225



Component Parts

| Item | Description | ER-825 Normal Duty | | ER-825 Heavy Duty | | ER-1225 Normal Duty | | ER-1225 Heavy Duty | |
|-------|---|--|-----|--|-----|--|-----|--|-----|
| | | Part Number | Qty | Part Number | Qty | Part Number | Qty | Part Number | Qty |
| 1 | †Bushing | 180-0137-180-0149 7/8" to 1-5/8" Bore | 1 | 180-0008-180-0018 7/8" to 1-1/2" Bore | 1 | 180-0262-180-0295 15/16" to 3" Bore | 1 | 180-0026-180-0057 3/4" to 2-11/16" Bore | 1 |
| 2 | Armature Hub | 540-0394 | 1 | | | 540-0015 | 1 | | |
| 3 | Splined Hub | | | 540-0057 | 1 | | | 540-0064 | 1 |
| 4 | Retainer Ring | | | 748-0006 | 1 | | | 748-0005 | 1 |
| 5 | Mounting Accessory, I.M. | 5321-101-001 | 1 | 5321-101-001 | 1 | 5321-101-001 | 1 | 5321-101-001 | 1 |
| 6 & 7 | Magnet (I.M., 90 volt) and Armature sold only in matched pairs* | 5250-30 | 1 | 5250-25 | 1 | 5252-9 | 1 | 5252-4 | 1 |
| 6-1 | Terminal Accessory | 5311-101-001 | 1 | 5311-101-001 | 1 | 5311-101-001 | 1 | 5311-101-001 | 1 |
| 8 | Autogap Accessory | 5201-101-008 | 3 | | | 5201-101-008 | 4 | | |
| 9 | Conduit Box | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 | 5200-101-010 | 1 |

† See page 198 for specific part numbers.

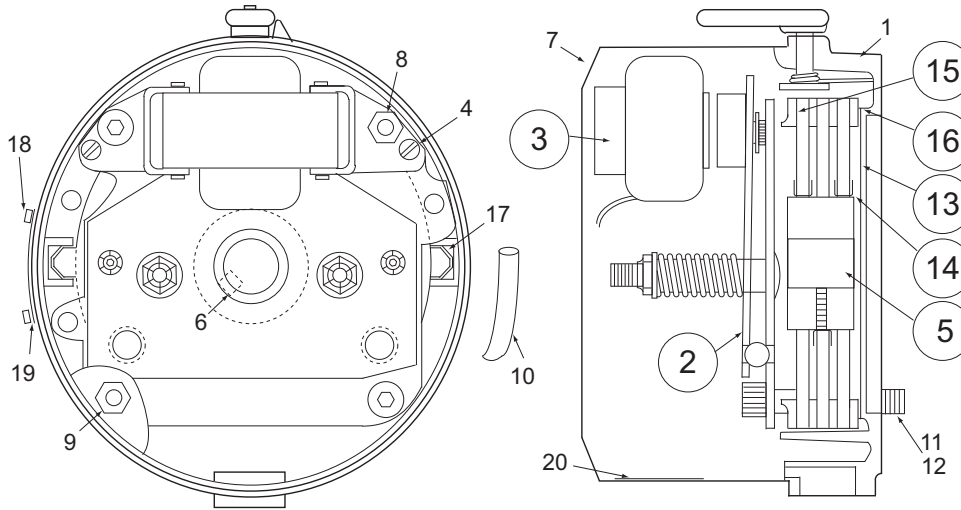
* Magnets and armatures sold only in pre-burnished sets to assure rated torque available upon installation.

These units, when used with the correct Warner Electric conduit box, meet the standards of UL508 and are listed under guide card #NMTR2, file #59164.



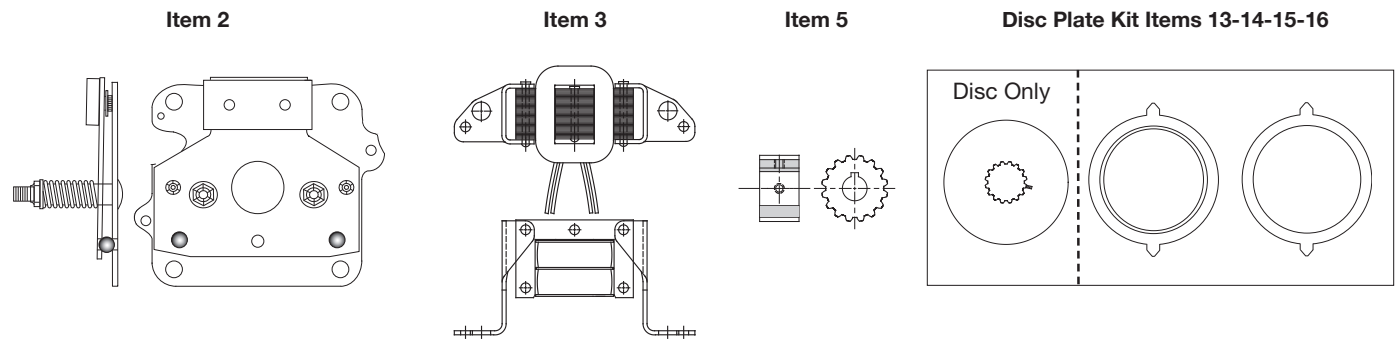
Service Parts

F-Series AC Rear-Mounted Brakes



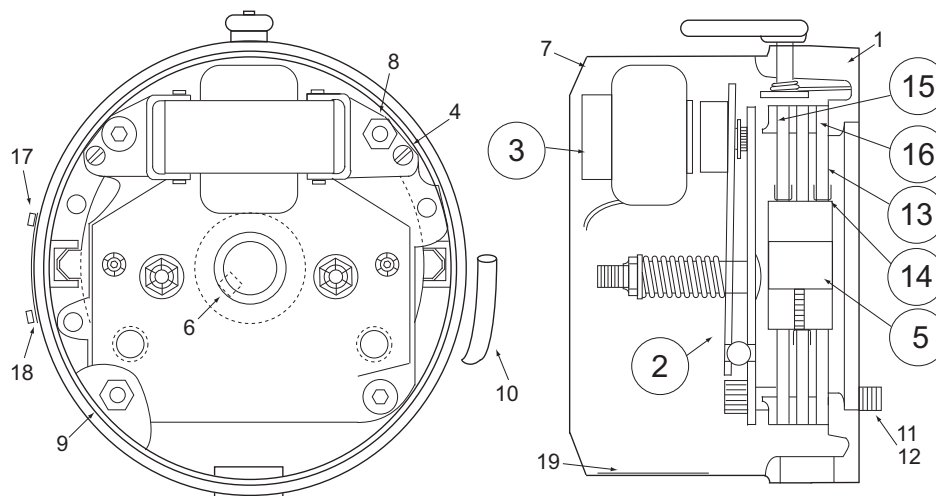
Component Parts

| Item | Description | Part No. | Qty. | Item | Description | | | |
|--------------|--|-------------------------|------------|------|-----------------------------------|---|---|----------------|
| 2 | Support & Armature Plate Assembly | 6, 10, & 15 ft.lb. | 79060-07-A | 1 | 1 | Brake Head Machined | | |
| | | 3 ft.lb. | 79060-07-B | 1 | | | | |
| | | 275/550V 60HZ | 79137-18-G | 1 | | | | |
| | | 230/460V 60HZ | 79137-18-J | 1 | | | | |
| | | 115/230V 60HZ | 79137-18-K | 1 | | | | |
| 3 | Coil and Pole Assembly | 200/400V 60HZ | 79137-18-L | 1 | 4 | 10-32 X 5/16 Slotted Hex Head With Split LW | | |
| | | 208/416V 50HZ | 79137-18-M | 1 | | | | |
| | | 115/230V 50HZ | 79137-18-N | 1 | | | | |
| | | 230/460V 50HZ | 79137-18-P | 1 | | | | |
| | | | | | | | | |
| 5 | Hub Assembly | 5/8 Bore | 58D22 | 1 | 6 | 3/16" SQR X 1" Key | | |
| | | 3/4 Bore | 58D23 | 1 | | | | |
| | | 7/8 Bore | 58D24 | 1 | | | | |
| 13 | Brake Disc (Individual) | 327213 | 1 | 7 | Brake Cover | | | |
| 13,14, 15,16 | Disc Plate Kit (Includes Disc & Pressure Plates) | 3 & 6 ft.lb. (1 disc) | 327212-1 | | | 1 | 8 | Stud Extension |
| | | 10 ft.lb. (2 discs) | 327212-2 | | | 1 | | |
| | | 15 ft.lb. (3 discs) | 327212-3 | 1 | | | | |
| 13,14, 15,16 | Disc Plate Kit (Includes Disc & Pressure Plates) | | | | 9 | 10-32 Hex Nut | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 10 | Insulating Sleeve | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 11 | 3/8-16 X 2-1/4" Socket Cap Screw | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 12 | 3/8" Hi-Collar Lock Washer | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 17 | Anti Rattle Spacer | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 18 | 6-32 X 1/4" Hex Washer Head Screw | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 19 | Nameplate | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | 20 | Instruction Label | | | |
| | | | | | | | | |
| | | | | | | | | |



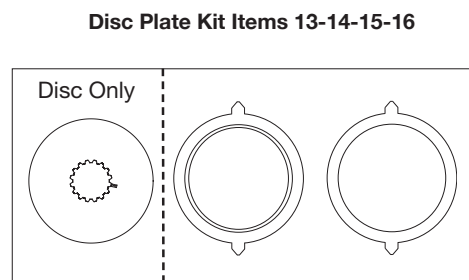
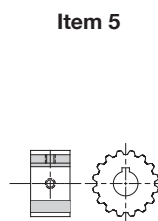
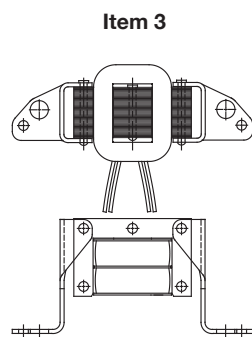
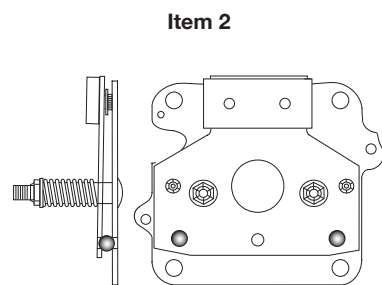
Service Parts

F-Series AC Rear-Mounted Brakes



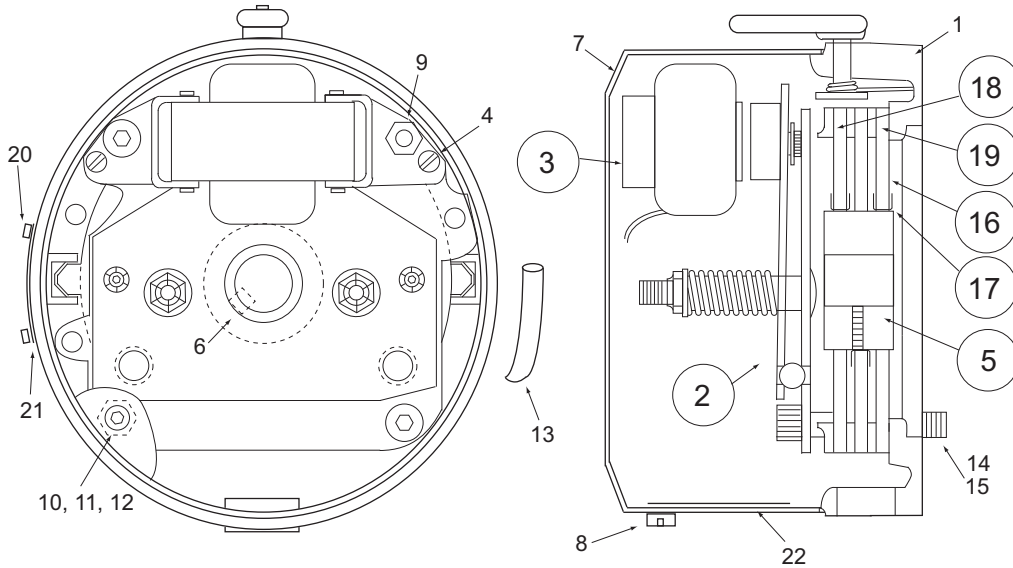
Component Parts

| Item | Description | Part No. | Qty. | Item | Description | |
|-------|-----------------------------------|-------------------------|------------|------|-------------------|---|
| 2 | Support & Armature Plate Assembly | 6, 10, & 15 ft.lb. | 79060-07-A | 1 | 1 | Brake Head Machined |
| | | 3 ft.lb. | 79060-07-B | 1 | 4 | 10-32 X 5/16 Slotted Hex Head With Split LW |
| 3 | Coil and Pole Assembly | 275/550V 60HZ | 79137-18-G | 1 | 6 | 3/16" SQR X 1" Key |
| | | 230/460V 60HZ | 79137-18-J | 1 | 7 | Brake Cover |
| | | 115/230V 60HZ | 79137-18-K | 1 | 8 | Stud Extension |
| | | 200/400V 60HZ | 79137-18-L | 1 | 9 | 10-32 Hex Nut |
| | | 208/416V 50HZ | 79137-18-M | 1 | 10 | Insulating Sleeve |
| | | 115/230V 50HZ | 79137-18-N | 1 | 11 | 3/8-16 X 2-1/2" Socket Cap Screw |
| 5 | Hub Assembly | 5/8 Bore | 58D22 | 1 | 12 | 3/8" Hi-Collar Lock Washer |
| | | 3/4 Bore | 58D23 | 1 | 17 | 6-32 X 1/4" Hex Washer Head Screw |
| | | 7/8 Bore | 58D24 | 1 | 18 | Nameplate |
| 13 | Brake Disc (Individual) | 327213 | 1 | 19 | Instruction Label | |
| 13,14 | Disc Plate Kit | 3 & 6 ft.lb. (1 disc) | 327212-4 | 1 | | |
| 15,16 | (Includes Disc & Pressure Plates) | 10 ft.lb. (2 discs) | 327212-5 | 1 | | |
| | | 15 ft.lb. (3 discs) | 327212-6 | 1 | | |



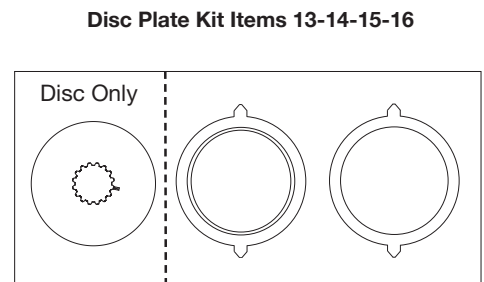
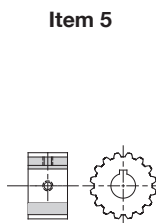
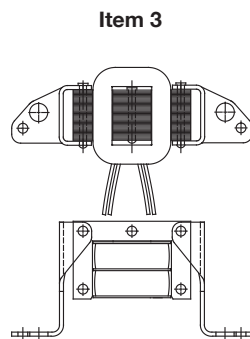
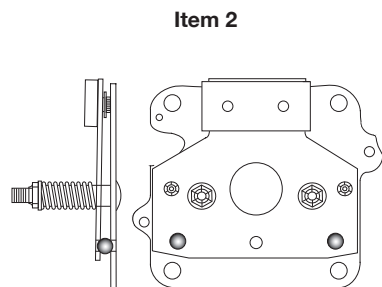
Service Parts

F-Series AC Rear-Mounted Brakes



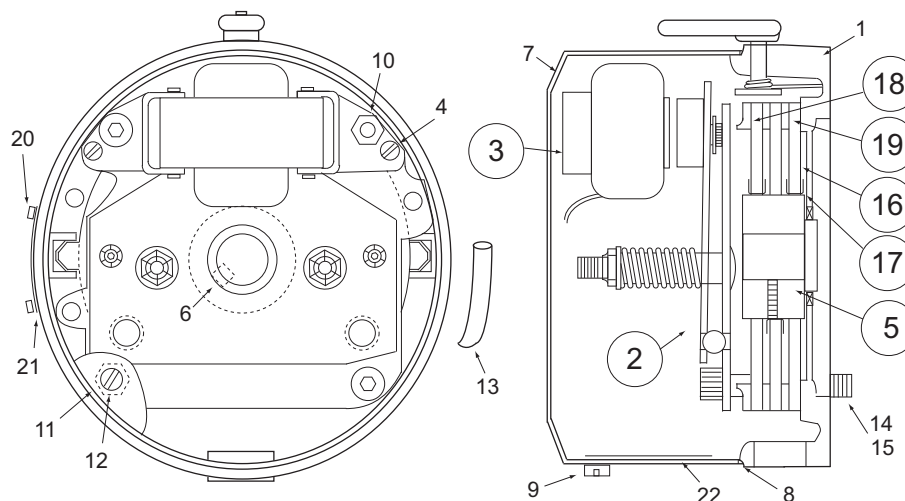
Component Parts

| Item | Description | Part No. | Qty. | Item | Description | | |
|----------|-----------------------------------|-------------------------|--------------|----------|-------------|---------------------|---|
| 2 | Support & Armature Plate Assembly | 6, 10, & 15 ft.lb. | 79060-07-A | 1 | 1 | Brake Head Machined | |
| | | 3 ft.lb. | 79060-07-B | 1 | | 4 | 10-32 X 5/16 Slotted Hex Head With Split LW |
| | | 275/550V 60HZ | 79137-18-G | 1 | | | 6 |
| | | 230/460V 60HZ | 79137-18-J | 1 | | 7 | |
| | | 115/230V 60HZ | 79137-18-K | 1 | | | 8 |
| 3 | Coil and Pole Assembly | 200/400V 60HZ | 79137-18-L | 1 | | 9 | |
| | | 208/416V 50HZ | 79137-18-M | 1 | | | 10 |
| | | 115/230V 50HZ | 79137-18-N | 1 | | 11 | |
| | | 230/460V 50HZ | 79137-18-P | 1 | | | 12 |
| | | 5 | Hub Assembly | 5/8 Bore | | 58D22 | |
| 3/4 Bore | 58D23 | | | 1 | | 14 | 3/8-16 X 2-1/2" Socket Cap Screw |
| 7/8 Bore | 58D24 | | | 1 | | | 15 |
| 16 | Brake Disc (Individual) | 3 & 6 ft.lb. (1 disc) | 327212-4 | 1 | | 20 | |
| | | 10 ft.lb. (2 discs) | 327212-5 | 1 | | | 21 |
| | | 15 ft.lb. (3 discs) | 327212-6 | 1 | | 22 | |



Service Parts

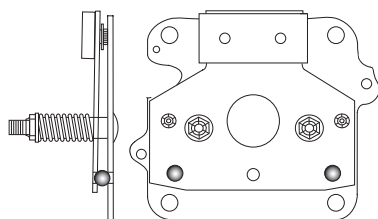
F-Series AC Rear-Mounted Brakes



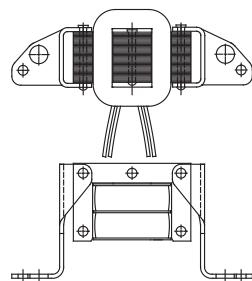
Component Parts

| Item | Description | Part No. | Qty. | Item | Description | | |
|---------------|-----------------------------------|-------------------------|---------------|------------|----------------------------|---|--------------------|
| 2 | Support & Armature Plate Assembly | 6, 10, & 15 ft.lb. | 79060-07-A | 1 | 1 | Brake Head Machined | |
| | | 3 ft.lb. | 79060-07-B | 1 | 4 | 10-32 X 5/16 Slotted Hex Head With Split LW | |
| | 3 | Coil and Pole Assembly | 275/550V 60HZ | 79137-18-G | 1 | 6 | 3/16" SQR X 1" Key |
| | | | 230/460V 60HZ | 79137-18-J | 1 | 7 | Brake Cover |
| 115/230V 60HZ | | | 79137-18-K | 1 | 8 | Brake Cover Gasket | |
| 200/400V 60HZ | | | 79137-18-L | 1 | 9 | Cover Plug | |
| 208/416V 50HZ | | | 79137-18-M | 1 | 10 | Stud Extension | |
| 115/230V 50HZ | | | 79137-18-N | 1 | 11 | 5/16" Split Lock Washer | |
| 5 | Hub Assembly | 5/8 Bore | 58D29 | 1 | 12 | 10-32 X 5/8" SS Pan Head With O-Ring | |
| | | 3/4 Bore | 58D30 | 1 | 13 | Insulating Sleeve | |
| | | 7/8 Bore | 58D31 | 1 | 14 | 3/8-16 X 2-1/2" Socket Cap Screw | |
| 16 | Brake Disc (Individual) | 327213 | 1 | 15 | 3/8" Hi-Collar Lock Washer | | |
| 16, 17 | Disc Plate Kit | 3 & 6 ft.lb. (1 disc) | 327212-4 | 1 | 20 | 9 Gage Escutcheon Pin | |
| | | 10 ft.lb. (2 discs) | 327212-5 | 1 | 21 | Nameplate | |
| | | 15 ft.lb. (3 discs) | 327212-6 | 1 | 22 | Instruction Label | |

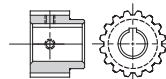
Item 2



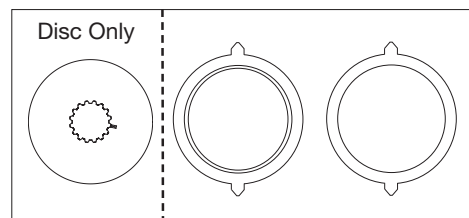
Item 3



Item 5



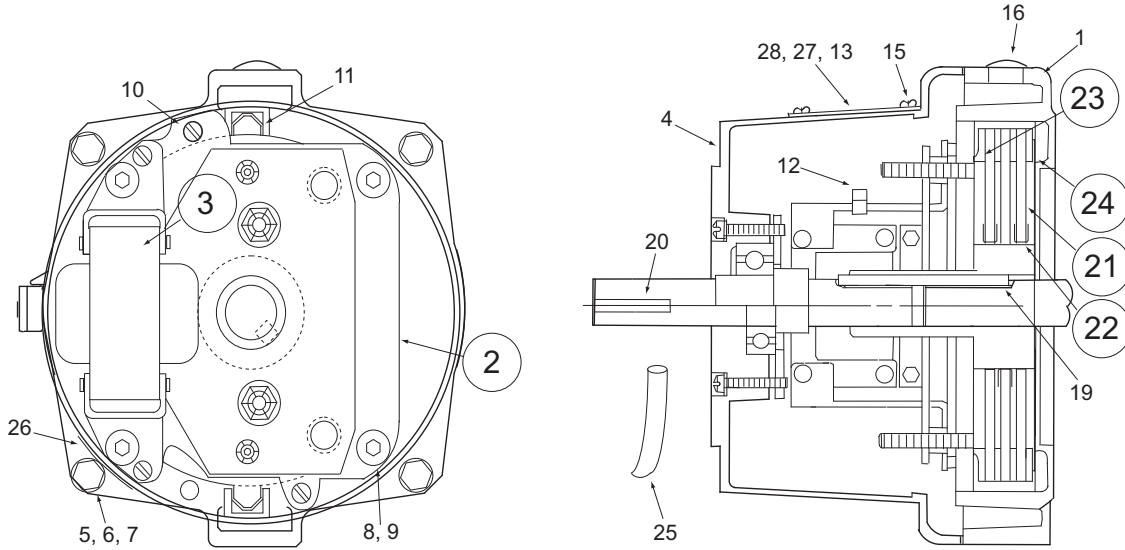
Disc Plate Kit Items 13-14-15-16



Service Parts

UNIBRAKES

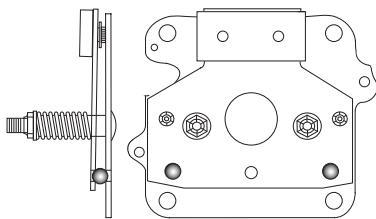
M-Series AC Coupler Brakes



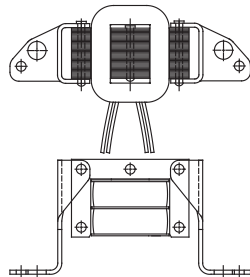
Component Parts

| Item | Description | Part No. | Qty. | Item | Description | |
|-------|-----------------------------------|-------------------------|------------|------|--------------------------|---------------------------------------|
| 2 | Support & Armature Plate Assembly | 6, 10, & 15 ft.lb. | 79060-07-A | 1 | 1 | Brake Head Machined |
| | | 3 ft.lb. | 79060-07-B | 1 | 4 | Brake Cover Assembly |
| 3 | Coil and Pole Assembly | 275/550V 60HZ | 79137-18-G | 1 | 5 | 1/4-20 X 1-1/2" Hex Cap Screw |
| | | 230/460V 60HZ | 79137-18-J | 1 | 6 | 1/4" Split Lock Washer |
| | | 115/230V 60HZ | 79137-18-K | 1 | 7 | 1/4-20 Hex Nut |
| | | 200/400V 60HZ | 79137-18-L | 1 | 8 | 3/8-16 X 2-1/4" Socket Cap Screw |
| | | 208/416V 50HZ | 79137-18-M | 1 | 9 | 3/8" Hi-Collar Lock Washer |
| | | 115/230V 50HZ | 79137-18-N | 1 | 10 | 1/4-20 X 3/8 Slotted Round Head Screw |
| | | 230/460V 50HZ | 79137-18-P | 1 | 11 | Anti Rattle Spacer |
| 21 | Brake Disc (Individual) | 327213 | 1 | 12 | Lead Clip | |
| 21,22 | Disc Plate Kit | 3 & 6 ft.lb. (1 disc) | 327212-1 | 1 | 13 | Window Cover Plate |
| 23,24 | (Includes Disc & Pressure Plates) | 10 ft.lb. (2 discs) | 327212-2 | 1 | 15 | 6-32 X 1/4" Hex Washer Head Screw |
| | | | | 16 | 1/2" Plug Button | |
| | | | | 19 | 3/16" SQR X 2-3/4" Key | |
| | | | | 20 | 3/16" SQR X 1-1/4" Key | |
| | | | | 25 | Insulating Sleeve | |
| | | | | 26 | Name Plate | |
| | | | | 27 | Instruction Label - Gap | |
| | | | | 28 | Instruction Label - Wire | |

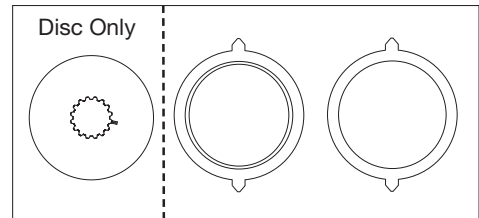
Item 2



Item 3

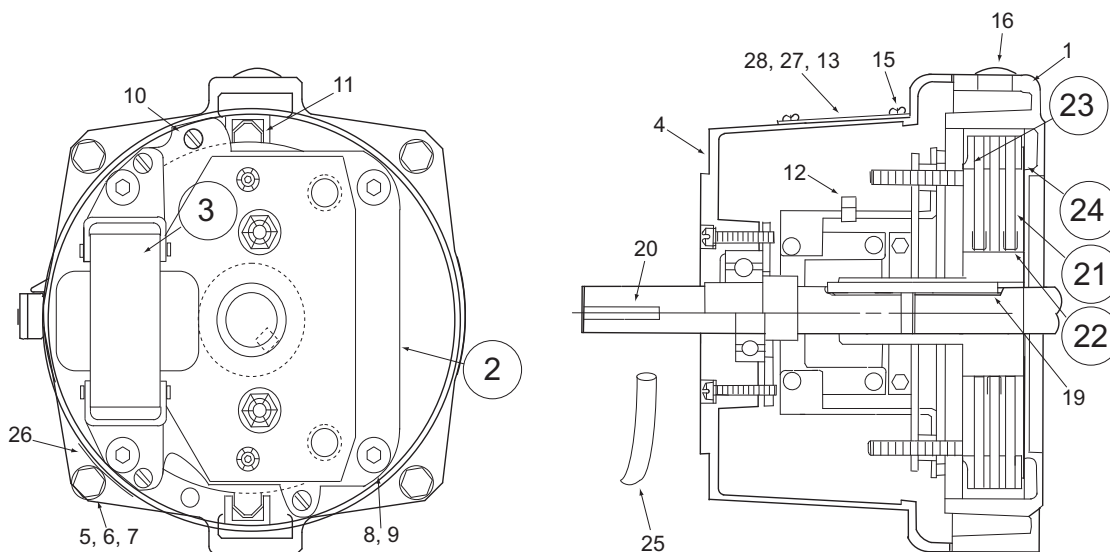


Disc Plate Kit Items 13-14-15-16



Service Parts

M-Series DC Coupler Brakes

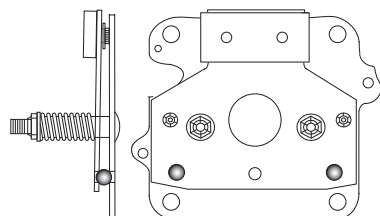


Component Parts

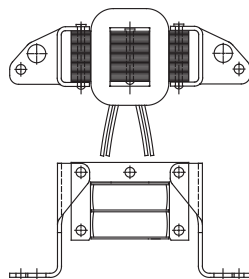
| Item | Description | | Part No. | Qty. |
|-------|-----------------------------------|-----------------------|------------|------|
| 2 | Support & Armature Plate Assembly | 3, 6, & 10 ft.lb. | 79060-07-A | 1 |
| 3 | Coil and Pole Assembly | 24 VDC | 327208 | 1 |
| | | 90 VDC | 327209 | 1 |
| 21 | Brake Disc (Individual) | | 327213 | 1 |
| 21,22 | Disc Plate Kit | 3 ft.lb. (1 disc) | 327212-1 | 1 |
| 23,24 | (Includes Disc & Pressure Plates) | 6 ft.lb. (2 discs) | 327212-2 | 1 |
| | | 10 ft.lb. (3 discs) | 327212-3 | 1 |

| Item | Description |
|------|---------------------------------------|
| 1 | Brake Head Machined |
| 4 | Brake Cover Assembly |
| 5 | 1/4-20 X 1-1/2" Hex Cap Screw |
| 6 | 1/4" Split Lock Washer |
| 7 | 1/4-20 Hex Nut |
| 8 | 3/8-16 X 2-1/4" Socket Cap Screw |
| 9 | 3/8" Hi-Collar Lock Washer |
| 10 | 1/4-20 X 3/8 Slotted Round Head Screw |
| 11 | Anti Rattle Spacer |
| 12 | Lead Clip |
| 13 | Window Cover Plate |
| 15 | 6-32 X 1/4" Hex Washer Head Screw |
| 16 | 1/2" Plug Button |
| 19 | 3/16" SQR X 2-3/4" Key |
| 20 | 3/16" SQR X 1-1/4" Key |
| 25 | Insulating Sleeve |
| 26 | Name Plate |
| 27 | Instruction Label - Gap |
| 28 | Instruction Label - Wire |

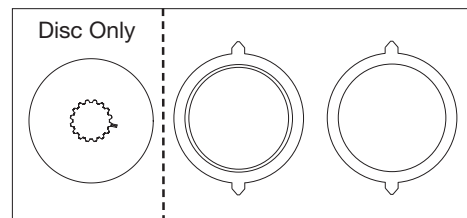
Item 2



Item 3



Disc Plate Kit Items 13-14-15-16



Service Parts

Part Numbers Ordering Information

C-face Compatible Units

Electro Modules - EM

| Description | Model | Part No. | Voltage | Pg. No. | |
|-----------------------------|--------------|--------------|---------|---------|----|
| Motor Clutch Module | EM-50-10 | 5370-270-201 | 6 | 24 | |
| | | 5370-270-203 | 24 | | |
| | | 5370-270-204 | 90 | | |
| | EM-100-10 | 5370-270-206 | 6 | 24 | |
| | | 5370-270-208 | 24 | | |
| | | 5370-270-209 | 90 | | |
| | EM-180-10 | 5370-270-211 | 6 | 24 | |
| | | 5370-270-213 | 24 | | |
| | | 5370-270-214 | 90 | | |
| | EM-210-10 | 5371-270-011 | 6 | 24 | |
| | | 5371-270-027 | 24 | | |
| | | 5371-270-009 | 90 | | |
| Brake Module | EM-50-20 | 5370-169-201 | 6 | 24 | |
| | | 5370-169-203 | 24 | | |
| | | 5370-169-204 | 90 | | |
| | EM-100-20 | 5370-169-206 | 6 | 24 | |
| | | 5370-169-208 | 24 | | |
| | | 5370-169-209 | 90 | | |
| | EM-180-20 | 5370-169-211 | 6 | 24 | |
| | | 5370-169-213 | 24 | | |
| | | 5370-169-214 | 90 | | |
| | EM-210-20 | 5371-169-022 | 6 | 24 | |
| | | 5371-169-034 | 24 | | |
| | | 5371-169-023 | 90 | | |
| | EM-215-20 | 5371-169-076 | 90 | 24 | |
| | | 5370-169-216 | 6 | | 24 |
| | | 5370-169-218 | 24 | | |
| | EM-50-20MB | 5370-169-219 | 90 | 24 | |
| | | 5370-169-221 | 6 | | |
| | | 5370-169-223 | 24 | | |
| EM-180-20MB | 5370-169-224 | 90 | 24 | | |
| | 5371-169-025 | 6 | | | |
| | 5371-169-035 | 24 | | | |
| EM-210-20MB | 5371-169-026 | 90 | 24 | | |
| | 5370-270-216 | 6 | | 24 | |
| | 5370-270-218 | 24 | | | |
| Input Clutch Module | EM-50-30 | 5370-270-219 | 90 | | 24 |
| | | 5370-270-221 | 6 | | |
| | | 5370-270-223 | 24 | | |
| | EM-100-30 | 5370-270-224 | 90 | 24 | |
| | | 5370-270-226 | 6 | | |
| | | 5370-270-228 | 24 | | |
| EM-180-30 | 5370-270-229 | 90 | 24 | | |
| | 5371-270-023 | 6 | | | |
| | 5371-270-026 | 24 | | | |
| EM-210-30 | 5371-270-024 | 90 | 24 | | |
| | EM-50-40 | 5370-536-200 | | - | 24 |
| | EM-100-40 | 5370-536-201 | | | 24 |
| Output Clutch Module | EM-180-40 | 5370-536-202 | | 24 | |
| | EM-210-40 | 5371-536-005 | | 24 | |

UniModules - UM

| Description | Model | Part No. | Voltage | Pg. No. |
|---|------------------------|--------------|---------|---------|
| Clutch/Brake UniModule Fully Assembled Brake/Clutch Unit | UM-50-1020 | 5370-273-201 | 6 | 14 |
| | | 5370-273-203 | 24 | |
| | | 5370-273-204 | 90 | |
| | UM-50-2030 | 5370-273-216 | 6 | 14 |
| | | 5370-273-218 | 24 | |
| | | 5370-273-219 | 90 | |
| | UM-100-1020 | 5370-273-206 | 6 | 14 |
| | | 5370-273-208 | 24 | |
| | | 5370-273-209 | 90 | |
| | UM-100-2030 | 5370-273-221 | 6 | 14 |
| | | 5370-273-223 | 24 | |
| | | 5370-273-224 | 90 | |
| | UM-180-1020 | 5370-273-211 | 6 | 14 |
| | | 5370-273-213 | 24 | |
| | | 5370-273-214 | 90 | |
| | UM-180-1020 Heavy-Duty | 5370-273-323 | 90 | 14 |
| | UM-180-2030 | 5370-273-226 | 6 | 14 |
| | | 5370-273-228 | 24 | |
| 5370-273-229 | | 90 | | |
| UM-210-1020 | 5371-273-002 | 6 | 14 | |
| | 5371-273-004 | 24 | | |
| | 5371-273-003 | 90 | | |
| UM-210-2030 | 5371-273-007 | 6 | 14 | |
| | 5371-273-009 | 24 | | |
| | 5371-273-008 | 90 | | |
| UM-215-1020 | 5371-273-076 | 6 | 14 | |
| | 5371-273-077 | 24 | | |
| | 5371-273-078 | 90 | | |
| UM-215-2030 | 5371-273-043 | 6 | 14 | |
| | 5371-273-044 | 24 | | |
| | 5371-273-045 | 90 | | |
| Clutch UniModule Fully Assembled Clutch Unit | UM-50-1040 | 5370-271-201 | 6 | 14 |
| | | 5370-271-203 | 24 | |
| | | 5370-271-204 | 90 | |
| | UM-50-3040 | 5370-271-216 | 6 | 14 |
| | | 5370-271-218 | 24 | |
| | | 5370-271-219 | 90 | |
| | UM-100-1040 | 5370-271-206 | 6 | 14 |
| | | 5370-271-208 | 24 | |
| | | 5370-271-209 | 90 | |
| | UM-100-3040 | 5370-271-221 | 6 | 14 |
| | | 5370-271-223 | 24 | |
| | | 5370-271-224 | 90 | |
| UM-180-1040 | 5370-271-211 | 6 | 14 | |
| | 5370-271-213 | 24 | | |
| | 5370-271-214 | 90 | | |
| UM-180-3040 | 5370-271-226 | 6 | 14 | |
| | 5370-271-228 | 24 | | |
| | 5370-271-229 | 90 | | |
| UM-210-1040 | 5371-271-002 | 6 | 14 | |
| | 5371-271-004 | 24 | | |
| | 5371-271-003 | 90 | | |
| UM-210-3040 | 5371-271-007 | 6 | 14 | |
| | 5371-271-009 | 24 | | |
| | 5371-271-008 | 90 | | |
| UM-215-1040 | 5371-271-026 | 6 | 14 | |
| | 5371-271-027 | 24 | | |
| | 5371-271-028 | 90 | | |
| UM-215-3040 | 5371-271-021 | 6 | 14 | |
| | 5371-271-022 | 24 | | |
| | 5371-271-023 | 90 | | |
| UM 1020 with Pre-Installed Controls | UM-50-1020 | 5370-273-230 | 90 | 14 |
| | UM-100-1020 | 5370-273-231 | 90 | |
| | UM-180-1020 | 5370-273-232 | 90 | |
| | UM-180-1020 Heavy-Duty | 5370-237-324 | 90 | |
| (CBC 150-1) | UM-210-1020 | 5371-4 | 90 | |
| | UM-215-1020 | 5371-273-090 | 90 | |

Part Numbers Ordering Information

C-face Compatible Units

UniModules – Ceramic Faced – UM-C

| Description | Model | Part No. | Voltage | Pg. No. | |
|-----------------|---------------|--------------|---------|---------|----|
| C-face Mount | UM-50-1020-C | 5370-273-271 | 6 | 42 | |
| | | 5370-273-273 | 24 | | |
| | | 5370-273-274 | 90 | | |
| | UM-180-1020-C | 5370-273-276 | 6 | | |
| | | 5370-273-278 | 24 | | |
| | | 5370-273-279 | 90 | | |
| UM-210-1020-C | 5371-273-035 | 6 | 42 | | |
| | 5371-273-036 | 24 | | | |
| | 5371-273-037 | 90 | | | |
| Base/Foot Mount | UM-50-2030-C | 5370-273-281 | 6 | 42 | |
| | | 5370-273-283 | 24 | | |
| | | 5370-273-284 | 90 | | |
| | UM-180-2030-C | 5370-273-286 | 6 | | |
| | | 5370-273-288 | 24 | | |
| | | 5370-273-289 | 90 | | |
| | UM-210-2030-C | 5371-273-039 | 6 | | 42 |
| | | 5371-273-040 | 24 | | |
| | | 5371-273-041 | 90 | | |

Smooth-Start UniModules

| Description | Model | Part No. | Voltage | Pg. No. |
|--------------|-------------|--------------|---------|---------|
| Smooth-Start | UM-50-1020 | 5370-273-236 | 90 | 40 |
| | UM-100-1020 | 5370-273-237 | 90 | 40 |
| | UM-180-1020 | 5370-273-238 | 90 | 40 |
| | UM-210-1020 | 5371-273-103 | 90 | 40 |
| | UM-215-1020 | 5371-273-080 | 90 | 40 |

Enclosed UniModules – EUM

| Description | Model | Part No. | Voltage | Pg. No. | |
|--------------|-----------------|--------------|---------|---------|----|
| C-face Mount | EUM-50-1020 | 5370-15 | 6 | 39, 49 | |
| | | 5370-16 | 24 | | |
| | | 5370-17 | 90 | | |
| | EUM-50-1040 | 5370-24 | 90 | | |
| | | 5370-18 | 6 | | |
| | | 5370-19 | 24 | | |
| | EUM-100-1020 | 5370-20 | 90 | | |
| | | 5370-21 | 6 | | |
| | | 5370-22 | 24 | | |
| | EUM-180-1020 | 5370-23 | 90 | | |
| | | 5370-25 | 90 | | |
| | | 5371-273-028 | 6 | | |
| | EUM-210-1020 | 5371-273-029 | 24 | | |
| | | 5371-273-027 | 90 | | |
| | | 5371-271-024 | 90 | | |
| | EUM-210-1040 | 5371-273-082 | 6 | | 51 |
| | | 5371-273-083 | 24 | | |
| | | 5371-273-084 | 90 | | |
| | Base/Foot Mount | EUM-50-2030 | 5370-26 | | 6 |
| | | | 5370-27 | | 24 |
| | | | 5370-28 | | 90 |
| EUM-180-2030 | | 5370-29 | 6 | | |
| | | 5370-30 | 24 | | |
| | | 5370-31 | 90 | | |
| EUM-210-2030 | | 5371-273-032 | 6 | 51 | |
| | | 5371-273-033 | 24 | | |
| | | 5371-273-031 | 90 | | |

Accessories for EM, UM, UM-C and EUM

| Description | Model | Part No. | Voltage | Pg. No. |
|--|--------------------------------|--------------|---------|---------|
| Conduit Box | All Sizes | 5370-101-042 | | 18 |
| Controls | CBC-150-1 | 6004-448-001 | 110 VAC | 204 |
| | CBC-150-2 | 6004-448-002 | 220 VAC | 204 |
| Base Mount Kits for 2030 and 3040 | EM/UM-50/100 | 5370-101-004 | — | 18 |
| | EM/UM-180 | 5370-101-002 | | 18 |
| | EM/EUM/UM-210 EM/EUM/UM-215 | 5371-101-001 | | 54 |
| Motor Mount Kits for 20, 1020, 1040 | EM/UM-50/100 | 5370-101-078 | — | 54 |
| | EM/UM-180 EUM-50/100/180 | 5370-101-079 | | 54 |
| | EM/EUM/UM-210 EM/EUM/UM-215 | 5371-101-012 | | 54 |
| Fan Kits for 1020 | EUM-50/100 | 5370-101-055 | | 54 |
| | UM-50-C | | | |
| | EUM-180 | 5370-101-054 | | 54 |
| | UM-180-C | | | |
| | EUM-210 UM-210-C | 5371-101-029 | | 54 |

Enclosed UniModules – Washdown Models – EUM-W

| Description | Model | Part No. | Voltage | Pg. No. | |
|-----------------|---------------|--------------|---------|---------|----|
| C-face Mount | EUM-50-1020W | 5370-273-100 | 6 | 60 | |
| | | 5370-273-101 | 24 | | |
| | | 5370-273-099 | 90 | | |
| | EUM-100-1020W | 5370-273-108 | 6 | | |
| | | 5370-273-109 | 24 | | |
| | | 5370-273-107 | 90 | | |
| | EUM-180-1020W | 5370-273-116 | 6 | | |
| | | 5370-273-117 | 24 | | |
| | | 5370-273-115 | 90 | | |
| | EUM-210-1020W | 5371-273-056 | 6 | | 60 |
| | | 5371-273-057 | 24 | | |
| | | 5371-273-055 | 90 | | |
| | EUM-215-1020W | 5371-273-086 | 6 | | |
| | | 5371-273-087 | 24 | | |
| 5371-273-088 | | 90 | | | |
| Base/Foot Mount | EUM-50-2030W | 5370-273-104 | 6 | 60 | |
| | | 5370-273-105 | 24 | | |
| | | 5370-273-103 | 90 | | |
| | EUM-180-2030W | 5370-273-120 | 6 | | |
| | | 5370-273-121 | 24 | | |
| | | 5370-273-119 | 90 | | |
| | EUM-210-2030W | 5371-273-060 | 6 | | 60 |
| | | 5371-273-061 | 24 | | |
| | | 5371-273-059 | 90 | | |

Accessories for EUM-W

| | | | | |
|-------------|---------------------------------|--------------|---------|-----|
| Conduit Box | All Sizes | 5370-101-045 | | 63 |
| Controls | CBC-150-1 | 6004-448-001 | 110 VAC | 204 |
| | CBC-150-2 | 6004-448-002 | 220 VAC | 204 |
| Base Mount | EUM-50W/180W | 5370-101-047 | | 63 |
| Motor Mount | EUM-210W | 5371-101-025 | | 63 |
| | EUM-50W EUM-100W EUM-180W | 5370-101-080 | | 63 |
| | EUM-210W EUM-215W | 5371-101-026 | | 63 |
| Fan Kits | EUM-50W/100W | 5370-101-060 | | 63 |
| | EUM-180W | 5370-101-061 | | 63 |
| | EUM-210W | 5371-101-033 | | 63 |

Part Numbers Ordering Information

Shaft Mounted Units

Electro Clutches - EC

| Description | Model | Part No. | Voltage | Pg. No. |
|---------------|---------------|--------------|---------|---------|
| EC-375 | EC-375-1/2 | 5180-271-006 | 6 | 67 |
| | | 5180-271-004 | 24 | |
| | | 5180-271-009 | 90 | |
| | EC-375-5/8 | 5180-271-002 | 6 | |
| | | 5180-271-008 | 24 | |
| | | 5180-271-005 | 90 | |
| EC-475 | EC-475-5/8 | 5181-271-033 | 6 | 67 |
| | | 5181-271-037 | 24 | |
| | | 5181-271-036 | 90 | |
| | EC-475-3/4 | 5181-271-032 | 6 | |
| | | 5181-271-038 | 24 | |
| | | 5181-271-034 | 90 | |
| EC-475-7/8 | 5181-271-031 | 6 | | |
| | 5181-271-039 | 24 | | |
| | 5181-271-035 | 90 | | |
| EC-650 | EC-650-1 | 5281-271-004 | 6 | 67 |
| | | 5281-271-018 | 24 | |
| | | 5281-271-007 | 90 | |
| | EC-650-1-1/8 | 5281-271-002 | 6 | |
| | | 5281-271-019 | 24 | |
| | | 5281-271-005 | 90 | |
| | EC-650-1-1/4 | 5281-271-009 | 6 | |
| | | 5281-271-020 | 24 | |
| | | 5281-271-008 | 90 | |
| | EC-650-1-3/8 | 5281-271-003 | 6 | |
| | | 5281-271-016 | 24 | |
| | | 5281-271-006 | 90 | |
| EC-825 | EC-825-1-1/8 | 5282-271-002 | 6 | 67 |
| | | 5282-271-008 | 24 | |
| | | 5282-271-011 | 90 | |
| | EC-825-1-1/4 | 5282-271-003 | 6 | |
| | | 5282-271-009 | 24 | |
| | | 5282-271-012 | 90 | |
| EC-825-1-3/8 | 5282-271-004 | 6 | | |
| | 5282-271-010 | 24 | | |
| | 5282-271-013 | 90 | | |
| EC-1000 | EC-1000-1-3/8 | 5283-271-002 | 6 | 67 |
| | | 5283-271-010 | 24 | |
| | | 5283-271-003 | 90 | |
| | EC-1000-1-1/2 | 5283-271-012 | 24 | |
| | | 5283-271-013 | 90 | |
| | | 5283-271-004 | 6 | |
| EC-1000-1-5/8 | 5283-271-011 | 24 | | |
| | 5283-271-005 | 90 | | |
| | 5283-271-004 | 6 | | |
| EC-1225 | EC-1225-1-5/8 | 5284-271-008 | 6 | 67 |
| | | 5284-271-013 | 24 | |
| | | 5284-271-010 | 90 | |
| | EC-1225-1-7/8 | 5284-271-002 | 6 | |
| | | 5284-271-014 | 24 | |
| | | 5284-271-003 | 90 | |
| EC-1225-2-1/8 | 5284-271-004 | 6 | | |
| | 5284-271-015 | 24 | | |
| | 5284-271-005 | 90 | | |

Electro Brakes - EB

| Description | Model | Part No. | Voltage | Pg. No. |
|-------------|------------|--------------|---------|---------|
| EB-375 | EB-375-1/2 | 5380-170-005 | 6 | 74 |
| | | 5380-170-006 | 24 | |
| | | 5380-170-004 | 90 | |
| | EB-375-5/8 | 5380-170-003 | 6 | |
| | | 5380-170-007 | 24 | |
| | | 5380-170-002 | 90 | |
| EB-475 | EB-475 | 5381-170-003 | 6 | |
| | | 5381-170-004 | 24 | |
| | | 5381-170-002 | 90 | |
| EB-650 | EB-650 | 5382-170-003 | 6 | |
| | | 5382-170-005 | 24 | |
| | | 5382-170-002 | 90 | |
| EB-825 | EB-825 | 5383-170-002 | 6 | |
| | | 5383-170-004 | 24 | |
| | | 5383-170-005 | 90 | |
| EB-1000 | EB-1000 | 5384-170-003 | 6 | |
| | | 5384-170-005 | 24 | |
| | | 5384-170-002 | 90 | |
| EB-1225 | EB-1225 | 5385-170-003 | 6 | |
| | | 5385-170-005 | 24 | |
| | | 5385-170-002 | 90 | |

Adapters for Electro Brakes

| Adapter No. | Part Number | Pg. No. |
|-------------|--------------|---------|
| 375-3/8 | 5380-101-005 | 79 |
| 375-7/8 | 5380-101-004 | 79 |
| 475-1-1/8 | 5381-101-003 | 79 |
| 650-1-3/8 | 5382-101-003 | 79 |
| 650-1-5/8 | 5382-101-002 | 79 |
| 1000-1-5/8 | 5384-101-008 | 79 |
| 1000-1-7/8 | 5384-101-007 | 79 |
| 1000-2-1/8 | 5384-101-010 | 79 |
| 1225-2-1/8 | 5385-101-008 | 79 |
| 1225-2-3/8 | 5383-101-007 | 79 |

Bushings for Electro Brakes

| Bushing No. | Part Number | Pg. No. |
|-------------|----------------------|---------|
| 1008 | Specify Bore Size | 198 |
| | 180-0410 to 180-0418 | |
| 1310 | Specify Bore Size | 198 |
| | 180-0421 to 180-0435 | |
| H-1, H-2 | Specify Bore Size | 198 |
| | 180-0002 to 180-0018 | |
| 1615 | Specify Bore Size | 198 |
| | 180-0131 to 180-0149 | |
| 2517 | Specify Bore Size | 198 |
| | 180-0185 to 180-0217 | |

Part Numbers Ordering Information

Shaft Mounted Units

AT Clutches - ATC

| Description | Model | Part No. | Voltage | Pg. No. |
|---------------|---------------|--------------|---------|---------|
| ATC-25 | ATC-25-1/2 | 5161-271-002 | 6 | 80 |
| | | 5161-271-010 | 24 | |
| | | 5161-271-003 | 90 | |
| | ATC-25-5/8 | 5161-271-004 | 6 | 80 |
| | | 5161-271-011 | 24 | |
| | | 5161-271-005 | 90 | |
| | ATC-25-3/4 | 5161-271-006 | 6 | 80 |
| | | 5161-271-012 | 24 | |
| | | 5161-271-007 | 90 | |
| ATC-25-7/8 | 5161-271-008 | 6 | 80 | |
| | 5161-271-013 | 24 | | |
| | 5161-271-009 | 90 | | |
| ATC-55 | ATC-55-3/4 | 5162-271-002 | 6 | 80 |
| | | 5162-271-010 | 24 | |
| | | 5162-271-003 | 90 | |
| | ATC-55-7/8 | 5162-271-004 | 6 | 80 |
| | | 5162-271-011 | 24 | |
| | | 5162-271-005 | 90 | |
| | ATC-55-1 | 5162-271-006 | 6 | 80 |
| | | 5162-271-012 | 24 | |
| | | 5162-271-007 | 90 | |
| ATC-55-1-1/8 | 5162-271-008 | 6 | 80 | |
| | 5162-271-013 | 24 | | |
| | 5162-271-009 | 90 | | |
| ATC-115 | ATC-115-1-1/8 | 5163-271-002 | 6 | 80 |
| | | 5163-271-010 | 24 | |
| | | 5163-271-003 | 90 | |
| | ATC-115-1-1/4 | 5163-271-004 | 6 | 80 |
| | | 5163-271-011 | 24 | |
| | | 5163-271-005 | 90 | |
| | ATC-115-1-3/8 | 5163-271-006 | 6 | 80 |
| | | 5163-271-012 | 24 | |
| | | 5163-271-007 | 90 | |
| ATC-115-1-1/2 | 5163-271-008 | 6 | 80 | |
| | 5163-271-013 | 24 | | |
| | 5163-271-009 | 90 | | |

AT Brakes - ATB

| Description | Model | Part No. | Voltage | Pg. No. |
|---------------|---------------|--------------|---------|---------|
| ATB-25 | ATB-25-1/2 | 5191-170-002 | 6 | 80 |
| | | 5191-170-010 | 24 | |
| | | 5191-170-003 | 90 | |
| | ATB-25-5/8 | 5191-170-004 | 6 | 80 |
| | | 5191-170-011 | 24 | |
| | | 5191-170-005 | 90 | |
| | ATB-25-3/4 | 5191-170-006 | 6 | 80 |
| | | 5191-170-012 | 24 | |
| | | 5191-170-007 | 90 | |
| ATB-25-7/8 | 5191-170-008 | 6 | 80 | |
| | 5191-170-013 | 24 | | |
| | 5191-170-009 | 90 | | |
| ATB-55 | ATB-55-3/4 | 5192-170-002 | 6 | 80 |
| | | 5192-170-010 | 24 | |
| | | 5192-170-003 | 90 | |
| | ATB-55-7/8 | 5192-170-004 | 6 | 80 |
| | | 5192-170-011 | 24 | |
| | | 5192-170-005 | 90 | |
| | ATB-55-1 | 5192-170-006 | 6 | 80 |
| | | 5192-170-012 | 24 | |
| | | 5192-170-007 | 90 | |
| ATB-55-1-1/8 | 5192-170-008 | 6 | 80 | |
| | 5192-170-013 | 24 | | |
| | 5192-170-009 | 90 | | |
| ATB-115 | ATB-115-1-1/8 | 5193-170-002 | 6 | 80 |
| | | 5193-170-010 | 24 | |
| | | 5193-170-003 | 90 | |
| | ATB-115-1-1/4 | 5193-170-004 | 6 | 80 |
| | | 5193-170-011 | 24 | |
| | | 5193-170-005 | 90 | |
| | ATB-115-1-3/8 | 5193-170-006 | 6 | 80 |
| | | 5193-170-012 | 24 | |
| | | 5193-170-007 | 90 | |
| ATB-115-1-1/2 | 5193-170-008 | 6 | 80 | |
| | 5193-170-013 | 24 | | |
| | 5193-170-009 | 90 | | |

Stationary Field Clutches - SFP

| Description | Model | Part No. | Voltage | Pg. No. |
|-------------|--------------|---------------|---------|---------|
| SFP-180 | SFP-180-1/4 | SFP180-14-24 | 24 | 92 |
| | | SFP180-516-24 | 24 | |
| | | SFP180-38-24 | 24 | |
| | SFP-180-5/16 | SFP180-14-90 | 90 | 92 |
| | | SFP180-516-90 | 90 | |
| | | SFP180-38-90 | 90 | |
| SFP-250 | SFP-250-3/8 | 5103-271-002 | 6 | 90 |
| | | 5103-271-006 | 24 | |
| | | 5103-271-010 | 90 | |
| | SFP-250-7/16 | 5103-271-003 | 6 | 90 |
| | | 5103-271-007 | 24 | |
| | | 5103-271-011 | 90 | |
| | SFP-250-1/2 | 5103-271-004 | 6 | 90 |
| | | 5103-271-008 | 24 | |
| | | 5103-271-012 | 90 | |
| SFP-250-5/8 | 5103-271-005 | 6 | 90 | |
| | 5103-271-009 | 24 | | |
| | 5103-271-013 | 90 | | |
| SFP-325 | SFP-325-1/2 | SFP325-12-24 | 24 | 93 |
| | | SFP325-12-90 | 90 | |

| Description | Model | Part No. | Voltage | Pg. No. |
|-------------|-------------|--------------|---------|---------|
| SFP-400 | SFP-400-1/2 | 5104-271-006 | 6 | 90 |
| | | 5104-271-016 | 24 | |
| | | 5104-271-021 | 90 | |
| | | 5104-271-007 | 6 | |
| | | 5104-271-017 | 24 | |
| | SFP-400-5/8 | 5104-271-022 | 90 | 90 |
| | | 5104-271-008 | 6 | |
| | | 5104-271-018 | 24 | |
| | | 5104-271-023 | 90 | |
| | | 5104-271-009 | 6 | |
| | SFP-400-3/4 | 5104-271-019 | 24 | 90 |
| | | 5104-271-024 | 90 | |
| | | 5104-271-010 | 6 | |
| | | 5104-271-020 | 24 | |
| | | 5104-271-025 | 90 | |

Part Numbers Ordering Information

Base Mounted Units

Electro Pack - EP

| Model | Part No. | Voltage | Pg. No. |
|-----------|--------------|---------|---------|
| EP-170 | 5633-273-002 | 6 | 94 |
| | 5633-273-003 | 24 | |
| | 5633-273-005 | 90 | |
| EP-250 | 5130-273-031 | 6 | 94 |
| | 5130-273-032 | 24 | |
| | 5130-273-034 | 90 | |
| EP-400 | 5131-273-009 | 6 | 94 |
| | 5131-273-010 | 24 | |
| | 5131-273-011 | 90 | |
| EP-500 | 5230-273-003 | 6 | 94 |
| | 5230-273-011 | 24 | |
| | 5230-273-002 | 90 | |
| EP-825 | 5231-273-003 | 6 | 94 |
| | 5231-273-004 | 24 | |
| | 5231-273-002 | 90 | |
| EP-1000 | 5232-273-003 | 6 | 94 |
| | 5232-273-005 | 24 | |
| | 5232-273-002 | 90 | |
| EP-1525 | 5234-273-003 | 6 | 94 |
| | 5234-273-002 | 90 | |
| EP-1525HT | 5234-273-017 | 24 | 94 |
| | 5234-273-012 | 90 | |

Electro Pack – Ceramic Faced - EP-C

| Model | Part No. | Voltage | Pg. No. |
|----------|--------------|---------|---------|
| EP-170-C | 5633-273-018 | 24 | 100 |
| | 5633-273-019 | 90 | |
| EP-250-C | 5130-273-053 | 24 | 100 |
| | 5130-273-054 | 90 | |

Electro Pack – Washdown

| Model | Part No. | Voltage | Pg. No. |
|----------|--------------|---------|---------|
| EP-250-W | 5130-273-060 | 24 | 104 |
| | 5130-273-061 | 90 | |
| EP-400-W | 5131-273-030 | 24 | 104 |
| | 5131-273-031 | 90 | |

Spring-Set Brakes (Static Holding) - ERS

| Description | Model | Part No. | Voltage | Pg. No. |
|-------------|--------------|--------------|---------|---------|
| ERS | ERS-26 | 5158-170-016 | 24 | 109 |
| | | 5158-170-015 | 90 | |
| | ERS-42 | 5151-170-002 | 24 | |
| | | 5151-170-001 | 90 | |
| | ERS-49 | 5155-170-002 | 24 | |
| | | 5155-170-001 | 90 | |
| ERS-57 | 5153-170-003 | 24 | | |
| | 5153-170-002 | 90 | | |
| ERS-68 | 5154-170-002 | 24 | | |
| | 5154-170-001 | 90 | | |

ERS Mounting Flanges (Optional)

| Model | Part No. | Pg. No. |
|--------|----------|---------|
| ERS-26 | 686-0182 | 113 |
| ERS-42 | 686-0183 | 113 |
| ERS-49 | 686-0184 | 113 |
| ERS-57 | 686-0185 | 113 |
| ERS-68 | 686-0186 | 113 |

Spring-Set Electrically Released Brakes

ERS Splined Hubs - ERS

| Model | Bore Size | Part No. | Pg. No. |
|--------|-------------|--------------|--------------|
| ERS-26 | .250 | 5158-541-006 | 112 |
| | .312 | 5158-541-007 | 112 |
| | .375 | 5158-541-008 | 112 |
| ERS-42 | .375 | 5151-541-002 | 112 |
| | .500 | 5151-541-003 | 112 |
| | .625 | 5151-541-004 | 112 |
| ERS-49 | .750 | 5151-541-005 | 112 |
| | .375 | 5155-541-002 | 112 |
| | .500 | 5155-541-003 | 112 |
| ERS-49 | .625 | 5155-541-004 | 112 |
| | .750 | 5155-541-005 | 112 |
| | .875 | 5155-541-006 | 112 |
| ERS-57 | .500 | 5153-541-004 | 112 |
| | .625 | 5153-541-005 | 112 |
| | .750 | 5153-541-006 | 112 |
| ERS-57 | .875 | 5153-541-007 | 112 |
| | 1.000 | 5153-541-008 | 112 |
| | ERS-68 | 1.000 | 5154-541-005 |
| 1.125 | | 5154-541-006 | 112 |
| 1.250 | | 5154-541-007 | 112 |
| ERS-68 | 1.375 | 5154-541-008 | 112 |
| | 1.500 | 5154-541-009 | 112 |
| | Conduit Box | 5154-101-001 | 112 |

EM/ERS Spring-Set Brake Modules

| Model | Part No. | Voltage | Pg. No. |
|---------------|--------------|---------|---------|
| EM-50/ERS-42 | 5370-170-201 | 24 | 117 |
| | 5370-170-203 | 90 | |
| EM-50/ERS-49 | 5370-170-206 | 24 | 117 |
| | 5370-170-207 | 90 | |
| EM-180/ERS-57 | 5370-170-211 | 24 | 117 |
| | 5370-170-212 | 90 | |
| EM-210/ERS-68 | 5371-170-042 | 24 | 117 |
| | 5371-170-043 | 90 | |

Spring-Set Brakes - ERD

| Model | Part No. | Pg. No. |
|----------------|------------|---------|
| ERD 5 | | 121 |
| ERD 10 | | 121 |
| ERD 20 | | 121 |
| ERD 35 | | 121 |
| ERD 60 | | 121 |
| ERD 100 | | 121 |
| ERD 170 | | 121 |
| ERD 300 | | 121 |
| ERD Rectifiers | ACG830A1P1 | 130 |
| | ACG830A1P2 | 130 |

Part Numbers Ordering Information

Electrically Released Brakes- Permanent Magnet

Permanent Magnet Brakes (Dynamic Cycling)

| Description | Model | Part No. | Voltage | Pg. No. |
|-------------|----------------|-----------------|---------|---------|
| FB | FB-375-1/2 | 5390-170-021 | 90 | 134 |
| | | 5390-170-024 | 24 | |
| | FB-375-5/8 | 5390-170-022 | 90 | 134 |
| | | 5390-170-023 | 24 | |
| | FB-475 | 5391-170-009 | 90 | 134 |
| | | 5391-170-012 | 24 | |
| FB-650 | 5392-170-007 | 90 | 134 | |
| | 5392-170-010 | 24 | | |
| ER | ER-375 | Drawing I-25766 | 90 | 138 |
| | ER-475 | Drawing I-25755 | 90 | 138 |
| | ER-650 | Drawing I-25767 | 90 | 138 |
| | ER-825 (N.D.) | Drawing I-25577 | 90 | 138 |
| | ER-825 (H.D.) | Drawing I-25578 | 90 | 138 |
| | ER-1225 (N.D.) | Drawing I-25619 | 36-75 | 138 |
| | ER-1225 (H.D.) | Drawing I-25620 | 35-75 | 138 |

UniModules - UM-FBC

| Description | Model | Part No. | Voltage | Pg. No. |
|----------------------------|----------------|--------------|---------|---------|
| Clutch/Brake UniModules | UM-50-1020FBC | 5370-273-243 | 24 | 144 |
| | | 5370-273-244 | 90 | |
| | UM-100-1020FBC | 5370-273-248 | 24 | 144 |
| | | 5370-273-249 | 90 | |
| | UM-180-1020FBC | 5370-273-253 | 24 | 144 |
| | | 5370-273-254 | 90 | |
| | UM-210-1020FBC | 5371-273-013 | 24 | 144 |
| | | 5371-273-012 | 90 | |
| | UM-215-1020FBC | 5371-273-099 | 24 | 144 |
| | | 5371-273-079 | 90 | |
| | UM-50-2030FBC | 5370-273-258 | 24 | 144 |
| | | 5370-273-259 | 90 | |
| | UM-100-2030FBC | 5370-273-263 | 24 | 144 |
| | | 5370-273-264 | 90 | |
| | UM-180-2030FBC | 5370-273-268 | 24 | 144 |
| | | 5370-273-269 | 90 | |
| | UM-210-2030FBC | 5371-273-018 | 24 | 144 |
| | | 5371-273-017 | 90 | |
| | UM-215-2030FBC | 5371-273-100 | 24 | 144 |
| | | 5371-273-101 | 90 | |

Accessories for UM-FBC, EUM-FBB/MBFB, and EM-FBB/FBC/MBFB

| Description | Model | Part No. | Voltage | Pg. No. |
|---|--------------------------------|--------------|---------|---------|
| Conduit Box | All Sizes | 5370-101-042 | | 63 |
| Controls All Sizes | CBC-160-1 | 6013-448-001 | 120 VAC | 205 |
| | CBC-160-2 | 6013-448-002 | 220 VAC | 205 |
| Base Mount Kits 2030 (FB only) | UM-50/100 | 5370-101-004 | — | 150 |
| | UM-180 | 5370-101-002 | | 150 |
| | UM-210/215 | 5371-101-019 | | 150 |
| Motor Mount Kits for 20FBB and 1020FBC | EM/UM-50/100 | 5370-101-078 | — | 149 |
| | EM/UM-180 | | | 149 |
| | EUM-50/100/180 | 5370-101-079 | | |
| | EM/EUM/UM-210 EM/EUM/UM-215 | 5371-101-012 | | 149 |

Shaft Mounted, Flange Mounted and C-face Compatible Units

Electro Modules

| Description | Model | Part No. | Voltage | Pg. No. |
|---------------|-------------------|--------------|---------|---------|
| Brake Module | EM-50-20FBB | 5370-169-278 | 24 | 159 |
| | | 5370-169-279 | 90 | |
| | EM-100-20FBB | 5370-169-283 | 24 | 159 |
| | | 5370-169-284 | 90 | |
| | EM-180-20FBB | 5370-169-288 | 24 | 159 |
| | | 5370-169-289 | 90 | |
| | EM-210-20FBB | 5371-169-032 | 24 | 159 |
| | | 5371-169-029 | 90 | |
| | EM-215-20FBB | 5371-169-100 | 24 | 159 |
| | | 5371-169-054 | 90 | |
| | EM-50-20FBC | 5370-169-233 | 24 | 159 |
| | | 5370-169-234 | 90 | |
| | EM-100-20FBC | 5370-169-238 | 24 | 159 |
| | | 5370-169-239 | 90 | |
| | EM-180-20FBC | 5370-169-243 | 24 | 159 |
| 5370-169-244 | | 90 | | |
| EM-210-20FBC | 5371-169-031 | 24 | 159 | |
| | 5371-169-028 | 90 | | |
| Motor Brake | EM-50-20MBFB | 5370-169-248 | 24 | 159 |
| | | 5370-169-249 | 90 | |
| | EM-100-20MBFB | 5370-169-253 | 24 | 159 |
| | | 5370-169-254 | 90 | |
| | EM-180-20MBFB | 5370-169-258 | 24 | 159 |
| | | 5370-169-259 | 90 | |
| | EM-210-7/8-20MBFB | 5371-169-101 | 24 | 159 |
| | | 5371-169-072 | 90 | |
| EM-210-20MBFB | 5371-169-033 | 24 | 159 | |
| | 5371-169-030 | 90 | | |

Enclosed UniModules

| Description | Model | Part No. | Voltage | Pg. No. | | |
|-------------------|----------------|----------------|-----------------|--------------|----|-----|
| Brake Module | EUM-50-20FBB-6 | 5370-169-260 | 90 | 152 | | |
| | | 5370-32 | 90 | 152 | | |
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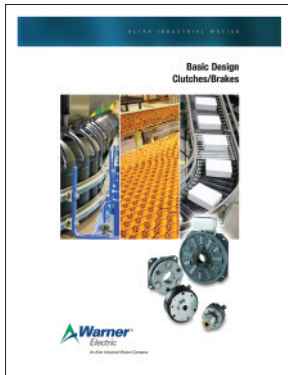
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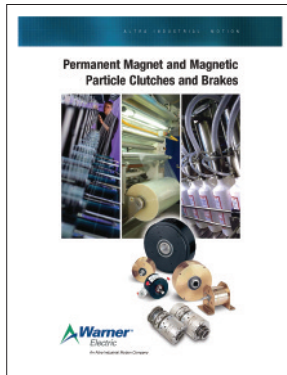
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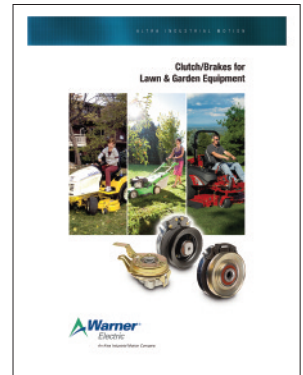
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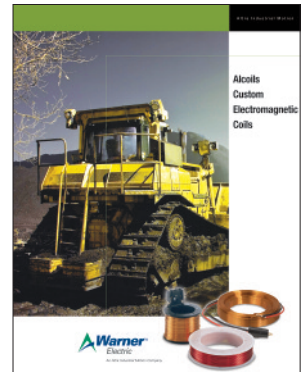
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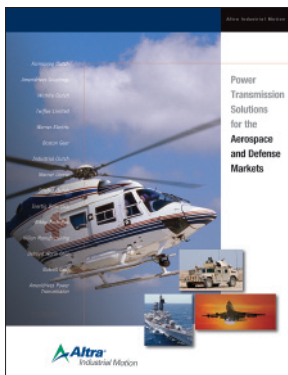
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