

PERMANENT MAGNET DC - WOUND FIELD DC



Overview of AMETEK Floorcare & Specialty Motors

AMETEK, Inc. is a leading global manufacturer of electronic instruments and electromechanical devices with annual sales of U.S. \$3.3 billion. AMETEK is headquartered in the U.S. and has approximately 14,000 colleagues working at more than 120 manufacturing facilities and more than 80 sales and service centers around the world. The common stock of AMETEK is listed on the New York Stock Exchange.

Prestolite Motors is a business unit of AMETEK Floorcare and Specialty Motors (F&SM), which is a Division of AMETEK, Inc. AMETEK F&SM is a global manufacturer of a high quality motors for a broad range of applications including car wash vacuums, central vacuums, commercial and household floorcare, environmental, health and fitness, HVLP, hydraulic power packs, lawn and garden, materials handling, medical equipment, spas, surface preparation, and hazardous duty uses.

We partner with leading OEMs around the world to engineer solutions designed to fit your particular application, and produce them at our ISO 9000 certified state of the art facilities in Mexico, Europe, China, and Brazil. Some of these locations were the recipients of the prestigious Dr. John H. Lux AMETEK Quality Award.

Our motor technologies include high speed series universal motors, permanent magnet DC motors, wound field DC motors with series, compound, and shunt fields. F&SM also offers a full line of stepper motors. Our Lamb brand commercial floorcare motors have set the industry standard for decades in performance and reliability.

AMETEK F&SM's engineering capabilities include 3D CAD, solid modeling, simulation, rapid prototyping and a full suite of test labs in our engineering centers in Ohio (U.S.A.), Milan (Italy), Shanghai (China), and Sao Paulo (Brazil).

AMETEK Prestolite Motors

AMETEK Prestolite Motors is recognized as a leader in high quality motors used in hydraulic power packs, winches, and traction drive motors. It has a very extensive line of DC motors, ranging in size from 2.4 inches (62mm) to 5 inches (127mm) and up to 8 HP.

Prestolite motors are available as permanent magnet (PMDC) or wound field designs. Motors range from a few amps to over 400 amps and are used in a wide range of applications. Some customization information of these motors can be found below.

Design Customization:		
+ Thermal protection	+ Terminal configurations	+ EMI solutions
+ Wide variety of frame coatings	+ Replaceable brushes optional	+ 12V, 24V, 36V, 48VDC
+ Uni-directional and bi-directional	+ IP protection designations	+ Long life brush-commutator systems
+ Custom mounting solutions	+ Continuous or intermittent duty	+ Series / compound / shunt
+ Low noise designs	+ Custom shafts	/ permanent magnet



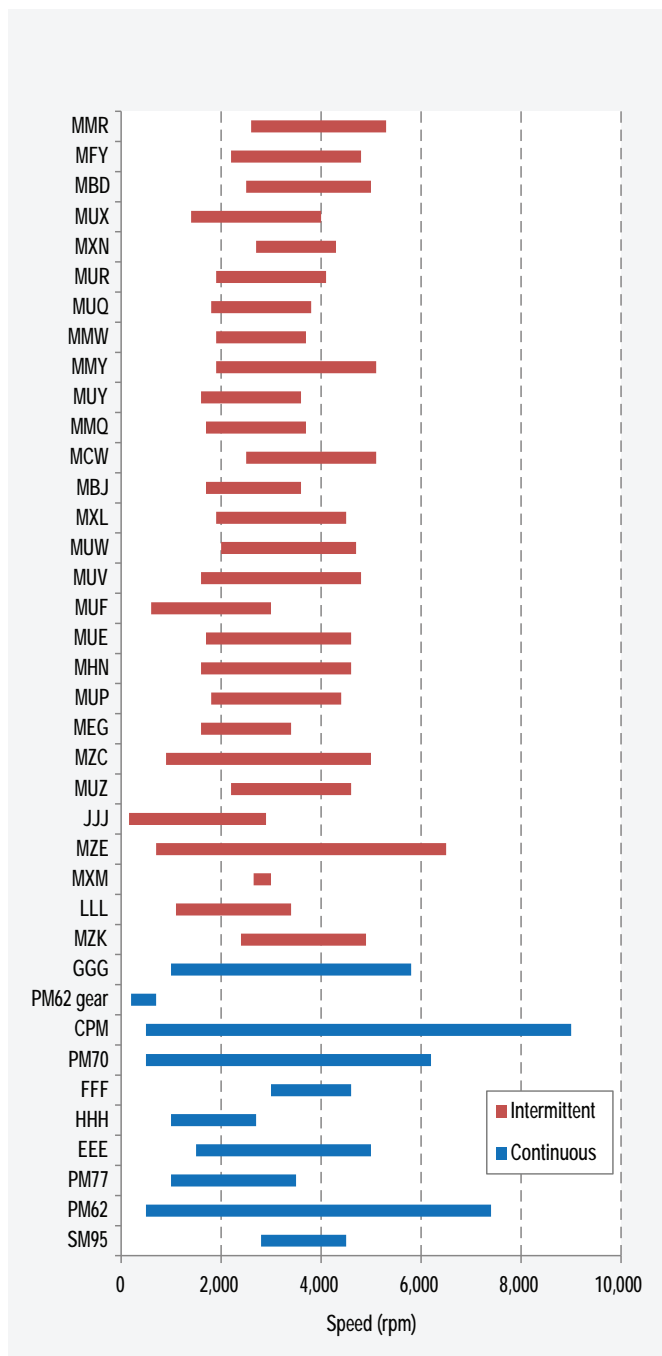
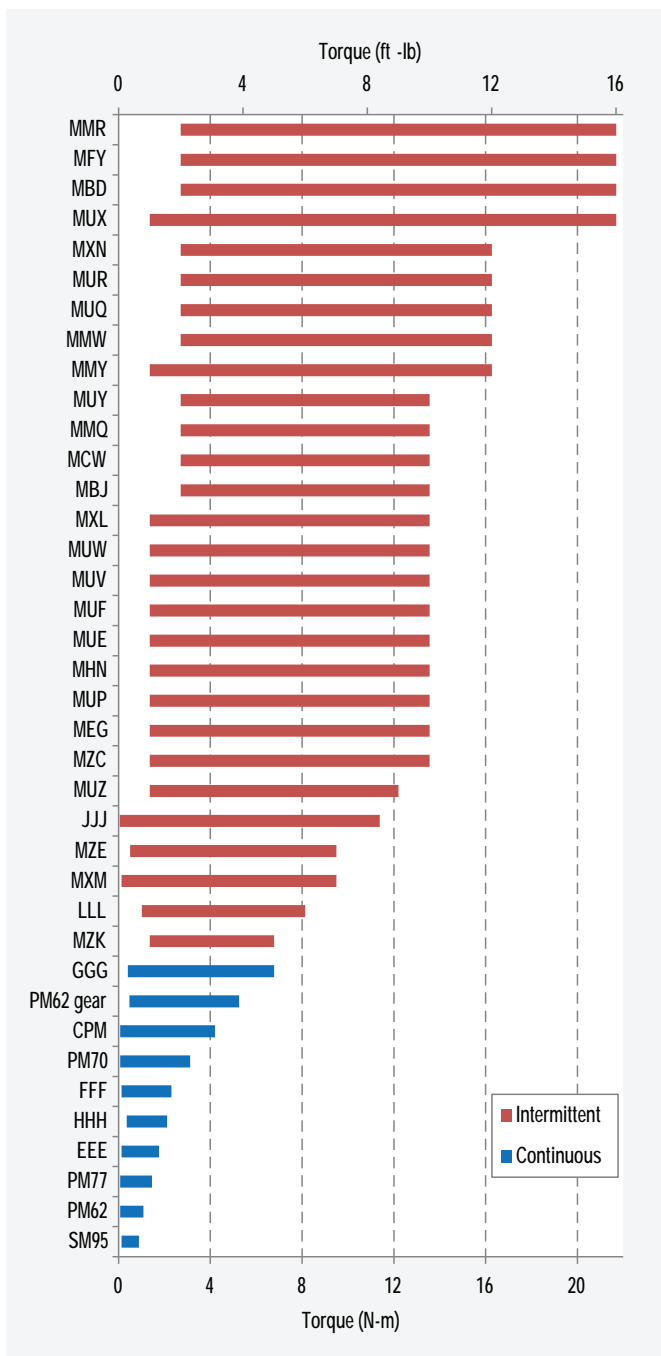
Prestolite Motors Family Summary

Motor family	Page	Frame size mm (in)	Field	Speed range rpm	Torque range N-m (ft-lb)	Max output W (hp)
PM62	7	62 (2.44)	Permanent magnet, 2-pole	500 - 7400	0.07-1.1 (0.05-0.8)	200 (0.3)
PM62 gear	7	62 (2.44)	Permanent magnet, 2-pole	200 - 700	0.5-5.3 (0.4-3.9)	130 (0.2)
PM70	8	70 (2.76)	Permanent magnet, 2-pole	500 - 6200	0.07-3.1 (0.05-2.3)	600 (0.8)
PM77	8	77 (3.03)	Permanent magnet, 2-pole	1000 - 3500	0.07-1.5 (0.05-1.1)	190 (0.3)
EEE	9	78 (3.06)	Permanent magnet, 2-pole	1500 - 5000	0.1-1.8 (0.1-1.3)	340 (0.5)
FFF	9	78 (3.09)	Permanent magnet, 4-pole	3000 - 4600	0.1-2.3 (0.1-1.7)	750 (1.0)
GGG	10	80 (3.13)	Permanent magnet, 6-pole	1000 - 5800	0.4-6.8 (0.3-5.0)	1340 (1.8)
CPM	10	83 (3.26)	Permanent magnet, 2-pole	500 - 9000	0.07-4.2 (0.05-3.1)	970 (1.3)
HHH	11	83 (3.29)	Permanent magnet, 2-pole	1000 - 2700	0.4-2.1 (0.3-1.6)	230 (0.3)
LLL	11	102 (4.00)	Permanent magnet, 4-pole	1100 - 3400	1.0-8.1 (0.8-6.0)	1120 (1.5)
JJJ	12	120 (4.72)	Permanent magnet, 4-pole	160 - 2900	0.05-11.4 (0.04-8.4)	2010 (2.7)
MZK	12	93 (3.67)	Series-wound, 4-pole	2400 - 4900	1.4-6.8 (1.0-5.0)	1720 (2.3)
MZE	13	93 (3.67)	Series-wound, 4-pole	700 - 6500	0.5-9.5 (0.4-7.0)	1190 (1.6)
MZC	13	93 (3.67)	Series-wound, 4-pole	900 - 5000	1.4-13.6 (1.0-10.0)	1720 (2.3)
SM95	14	95 (3.74)	Shunt-wound, 2-pole	2800 - 4500	0.1-0.9 (0.1-0.7)	250 (0.3)
MXM	14	114 (4.50)	Shunt-wound, 4-pole	2650 - 3000	0.1-9.5 (0.1-7.0)	2240 (3.0)
MUZ	15	114 (4.50)	Compound-wound, 4-pole	2200 - 4600	1.4-12.2 (1.0-9.0)	2680 (3.6)
MEG	15	114 (4.50)	Compound-wound, 4-pole	1600 - 3400	1.4-13.6 (1.0-10.0)	2240 (3.0)
MUP	16	114 (4.50)	Compound-wound, 4-pole	1800 - 4400	1.4-13.6 (1.0-10.0)	2680 (3.6)
MHN	16	114 (4.50)	Series-wound, 4-pole	1600 - 4600	1.4-13.6 (1.0-10.0)	2240 (3.0)
MUE	17	114 (4.50)	Series-wound, 4-pole	1700 - 4600	1.4-13.6 (1.0-10.0)	2540 (3.4)
MUF	17	114 (4.50)	Series-wound, 4-pole	600 - 3000	1.4-13.6 (1.0-10.0)	970 (1.3)
MUV	18	114 (4.50)	Series-wound, 4-pole	1600 - 4800	1.4-13.6 (1.0-10.0)	2540 (3.4)
MUW	18	114 (4.50)	Series-wound, 4-pole	2000 - 4700	1.4-13.6 (1.0-10.0)	2910 (3.9)
MXL	19	114 (4.50)	Series-wound, 4-pole	1900 - 4500	1.4-13.6 (1.0-10.0)	2830 (3.8)
MBJ	19	114 (4.50)	Series-wound, 4-pole	1700 - 3600	2.7-13.6 (2.0-10.0)	2540 (3.4)
MCW	20	114 (4.50)	Series-wound, 4-pole	2500 - 5100	2.7-13.6 (2.0-10.0)	3580 (4.8)
MMQ	20	114 (4.50)	Series-wound, 4-pole	1700 - 3700	2.7-13.6 (2.0-10.0)	2460 (3.3)
MUY	21	114 (4.50)	Series-wound, 4-pole	1600 - 3600	2.7-13.6 (2.0-10.0)	2310 (3.1)
MMY	21	114 (4.50)	Series-wound, 4-pole	1900 - 5100	1.4-16.3 (1.0-12.0)	3430 (4.6)
MMW	22	114 (4.50)	Series-wound, 4-pole	1900 - 3700	2.7-16.3 (2.0-12.0)	3360 (4.5)
MUQ	22	114 (4.50)	Series-wound, 4-pole	1800 - 3800	2.7-16.3 (2.0-12.0)	3130 (4.2)
MUR	23	114 (4.50)	Series-wound, 4-pole	1900 - 4100	2.7-16.3 (2.0-12.0)	3360 (4.5)
MUX	23	114 (4.50)	Series-wound, 4-pole	1400 - 4000	1.4-21.7 (1.0-16.0)	3360 (4.5)
MXN	24	127 (5.00)	Compound-wound, 4-pole	2700 - 4300	2.7-16.3 (2.0-12.0)	4620 (6.2)
MBD	24	127 (5.00)	Series-wound, 4-pole	2500 - 5000	2.7-21.7 (2.0-16.0)	5590 (7.5)
MFY	25	127 (5.00)	Series-wound, 4-pole	2200 - 4800	2.7-21.7 (2.0-16.0)	5290 (7.1)
MMR	25	127 (5.00)	Series-wound, 4-pole	2600 - 5300	2.7-21.7 (2.0-16.0)	5890 (7.9)

Prestolite Motors Applications

Applications	PM – 80mm (3.1") and smaller	PM – 83mm (3.3") and larger	Wound field – 93mm (3.7")	Wound field – 114mm (4.5")	Wound field – 127mm (5")
Agricultural machinery	●	●	●	●	●
Passenger lifts	●		●	●	
Aerial work platforms			●	●	●
Tailgate and freight lift on trucks				●	
Boom lifts					●
Forklifts and stackers				●	
Hand and rider pallet trucks	●				
Car lift				●	
RV levelers and sliders	●				
Dump trucks and trailers				●	●
Auxiliary braking assist		●			
Auxiliary steering assist					●
Winches	●	●		●	
Hoists		●		●	
Snow plow	●			●	
Saltspreader	●	●			
Marine windlass				●	●
Marine bowthruster					●
Traction motor for pallet truck		●			
Wheelchair	●	●			
Snowblower		●			
Treadmill	●	●			
Industrial pumps	●	●	●	●	
Beverage pumps	●				

Prestolite Motors Model Capabilities by Torque / Speed



REFERENCE

UL Insulation Class

The insulation class of a motor reflects the maximum temperature the motor can endure without damage to the internal insulation materials. The following are recognized insulation class ratings by Underwriters Laboratory:

Class	A	E	B	F	H	N
Temperature (°C)	105	120	130	155	180	200

Type of Motor Duty

The International Electrotechnical Commission uses eight duty cycle designations to describe an electrical motor's operating conditions:

S1 = Continuous duty

The motor works at a constant load for enough time to reach temperature equilibrium.

S2 = Short-time duty

The motor works at a constant load, but not long enough to reach temperature equilibrium. The rest periods are long enough for the motor to reach ambient temperature.

S3 = Intermittent periodic duty

Sequential, identical run and rest cycles with constant load. Temperature equilibrium is never reached. Starting current has little effect on temperature rise.

S4 = Intermittent periodic duty with starting

Sequential, identical start, run and rest cycles with constant load. Temperature equilibrium is not reached, but starting current affects temperature rise.

S5 = Intermittent periodic duty with electric braking

Sequential, identical cycles of starting, running at constant load, electric braking, and rest cycles.

S6 = Continuous operation with intermittent load

Sequential, identical cycles of running with constant load and running with no load. No rest periods.

S7 = Continuous operation with electric braking

Sequential identical cycles of starting, running at constant load and electric braking. No rest periods.

S8 = Continuous operation with periodic changes in load and speed

Sequential, identical duty cycles run at constant load and given speed, then run at other constant loads and speeds. No rest periods.

Protection Degree

The protection designation indicates the level of prevention between live (electrical) parts of the motor and people or foreign matter and the ability of the motor to prevent the penetration of water.

Designation IPxx

IP First number - Protection against solid objects

-
- 0** = No special protection

 - 1** = Protected against solid objects over 50 mm, e.g. accidental touch by persons hands

 - 2** = Protected against solid objects over 12 mm, e.g. persons fingers

 - 3** = Protected against solid objects over 2.5 mm (tools and wires)

 - 4** = Protected against solid objects over 1 mm (tools, wires, and small wires)

 - 5** = Protected against dust limited ingress (no harmful deposit)

 - 6** = Totally protected against dust

IP Second number - Protection against liquids

-
- 0** = No protection

 - 1** = Protection against vertically falling drops of water e.g. condensation

 - 2** = Protection against vertically falling drops of water with enclosure tilted 15°

 - 3** = Protected against direct sprays of water up to 60° from the vertical

 - 4** = Protection against water sprayed from all directions - limited ingress permitted

 - 5** = Protected against low pressure jets of water from all directions - limited ingress

 - 6** = Protected against temporary flooding of water, e.g. for use on ship decks - limited ingress permitted

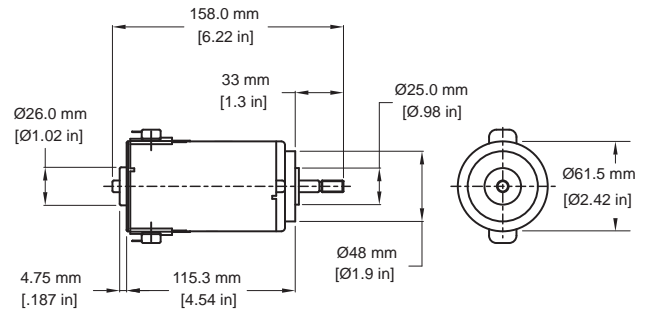
 - 7** = Protected against the effect of immersion between 15 cm and 1 m

 - 8** = Protects against long periods of immersion under pressure

PM62 Family

Description

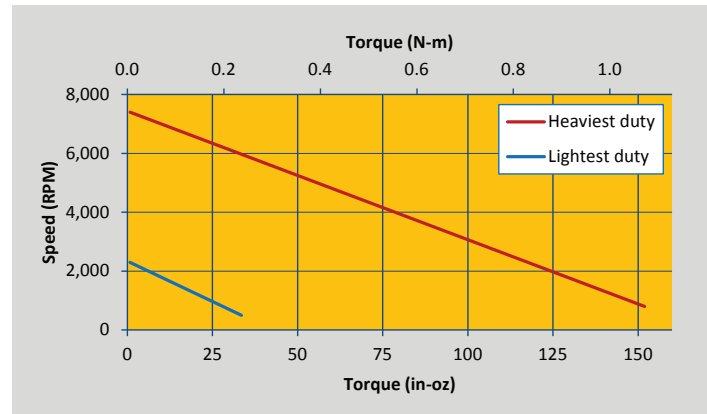
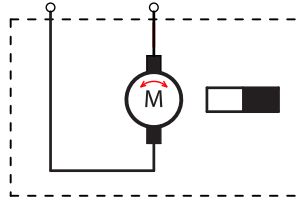
- 62mm (2.44 in)
- 6-48 VDC, 90-240 VAC
- PM field, 2-pole
- 200 W (0.3 hp) max, 500-7400 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

- Coffee grinders
- Vending line actuators
- Power shower pumps
- Water pumps
- Medical chair actuators



PM62 with Gear (axial and right angle)

Description

- Easily customizable to work with many customer gearbox combinations
- Prestolite application specialists provide solutions for OEMs



Typical Applications

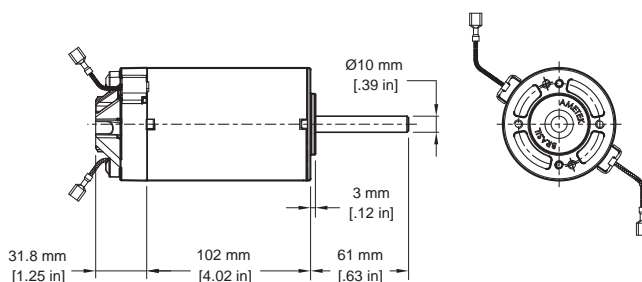
- Coffee grinders
- Slicing machines



PM70 Family

Description

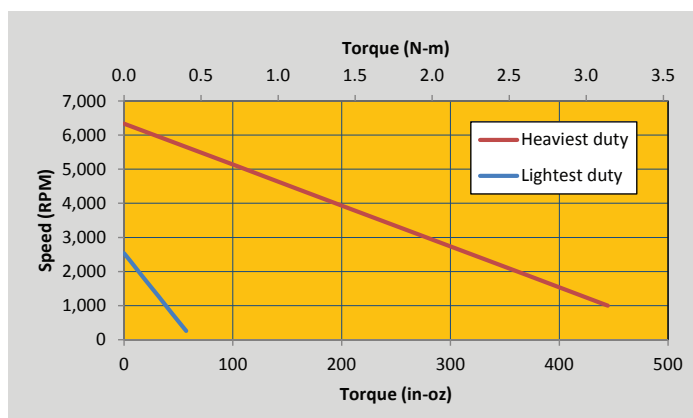
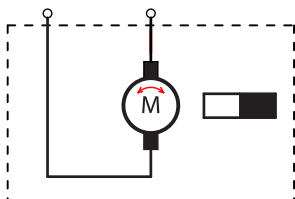
- 70mm (2.76 in)
- 12-36 VDC, 120-240 VAC
- PM field, 2-pole
- 600 W (0.8 hp) max, 500-6200 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

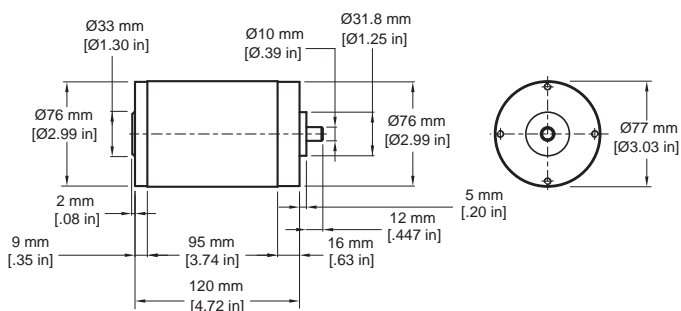
- Treadmills
- Pool cleaner pumps
- Industrial drives
- Gearmotors
- Machine tools



PM77 Family

Description

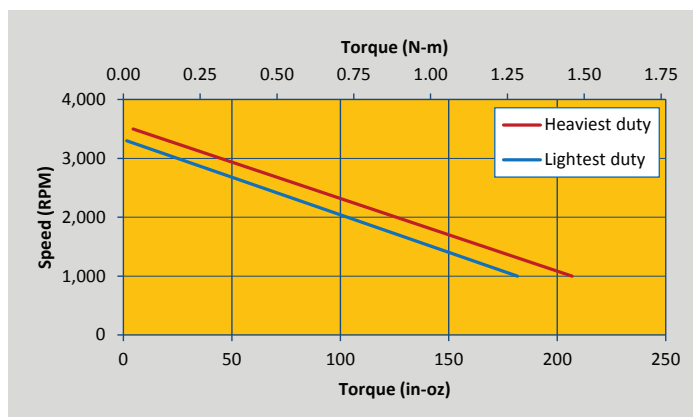
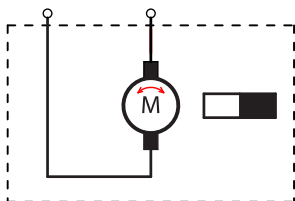
- 77mm (3.03 in)
- 12-36 VDC, 120-240 VAC
- PM field, 2-pole
- 190 W (0.3 hp) max, 1000-3500 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

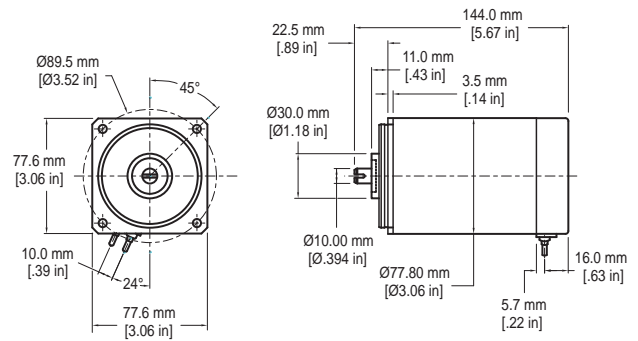
- Treadmills
- Industrial drives
- Actuators
- Conveyors
- Water pumps
- Fuel transfer pumps



EEE Family

Description

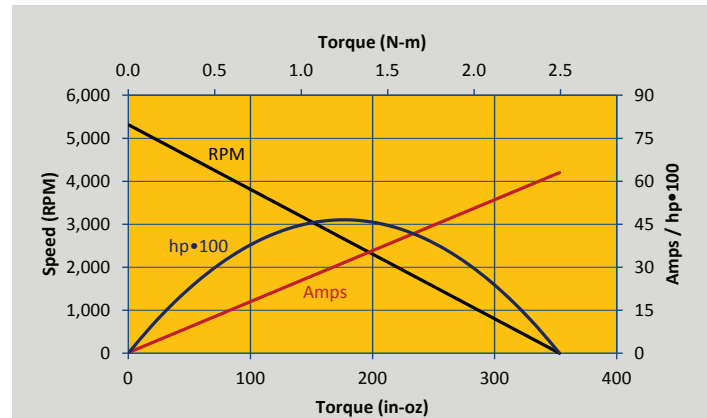
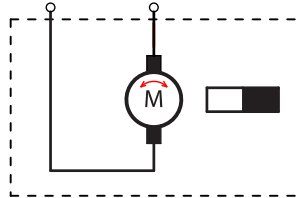
- 78mm (3.06 in)
- 12-24 VDC
- PM field, 2-pole
- 340 W (0.5 hp) max, 1500-5000 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

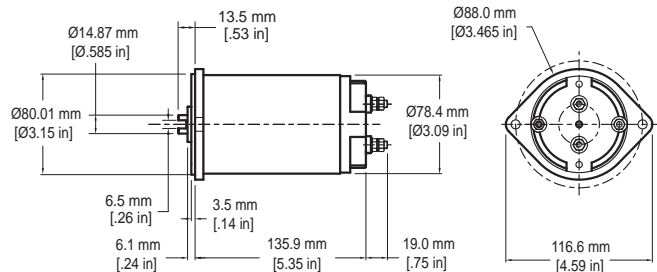
- Pumps and powerpacks
- Truck cab tilt



FFF Family

Description

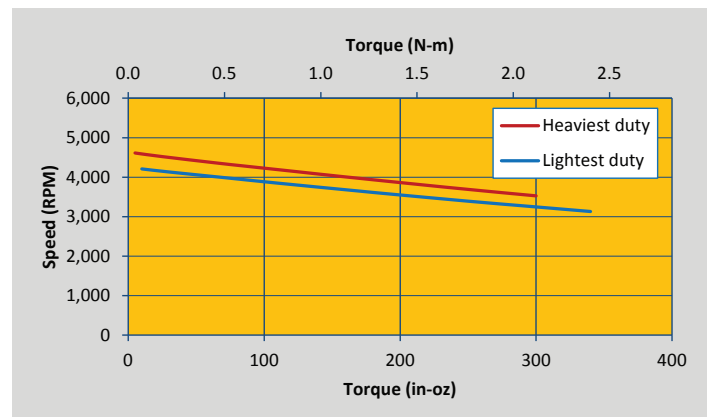
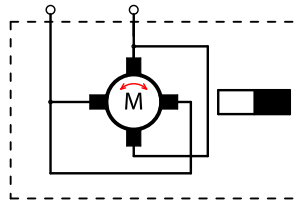
- 78mm (3.09 in)
- 12-24 VDC
- PM field, 4-pole
- 750 W (1.0 hp) max, 3000-4600 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

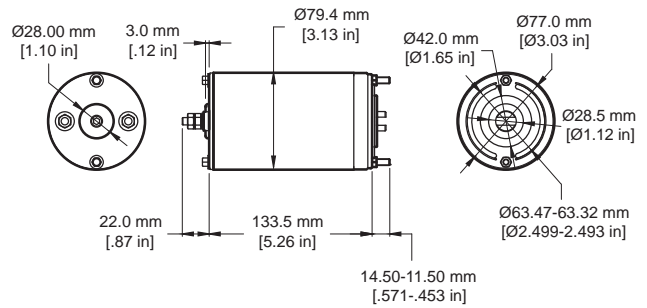
- Pumps and powerpacks
- Pallet trucks
- RV levelers and sliders
- Winches
- Snow plows
- Salt spreaders
- Windlasses



GGG Family

Description

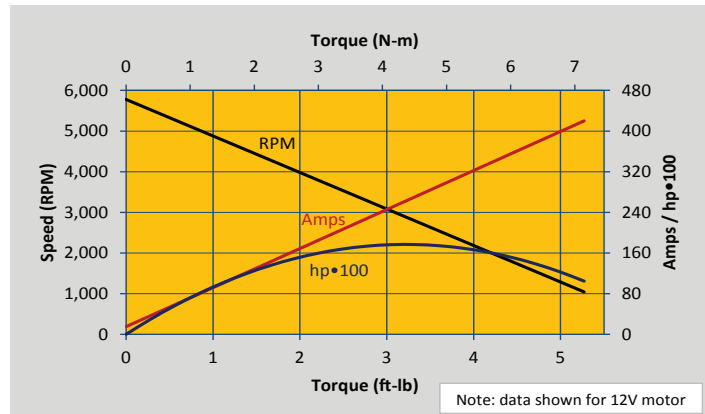
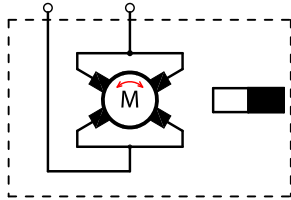
- 80mm (3.13 in)
- 12-24 VDC
- PM field, 6-pole
- 1340 W (1.8 hp) max, 1000-5800 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

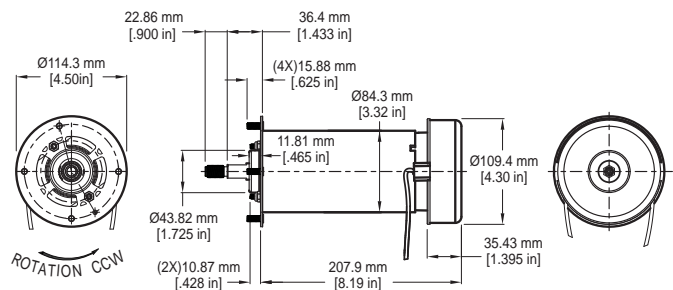
- Pumps and powerpacks
- Passenger lifts
- Pallet trucks
- RV levelers and sliders
- Winches
- Windlasses
- Salt spreaders



CPM Family

Description

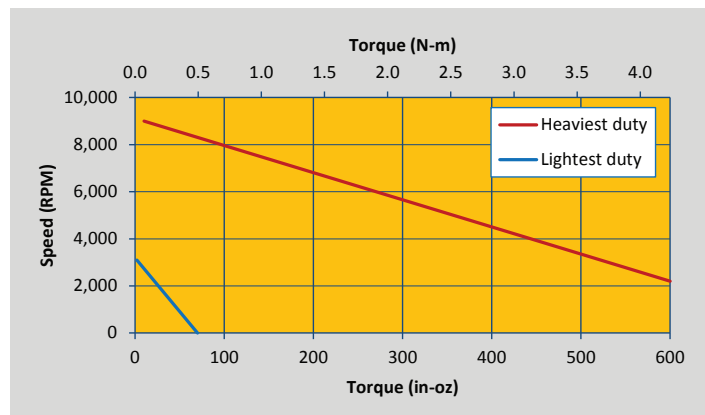
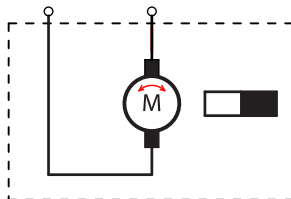
- 83mm (3.26 in)
- 6-48 VDC, 120-240 VAC
- PM field, 2-pole
- 970 W (1.3 hp) max, 500-9000 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

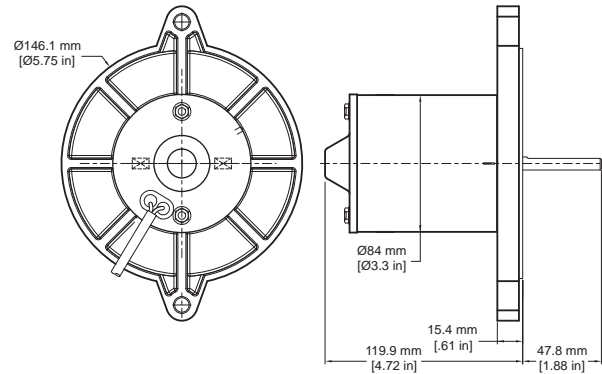
- Lawn mowers
- Wheelchairs
- Water pumps
- Treadmills
- Garage door openers
- Paper shredders



HHH Family

Description

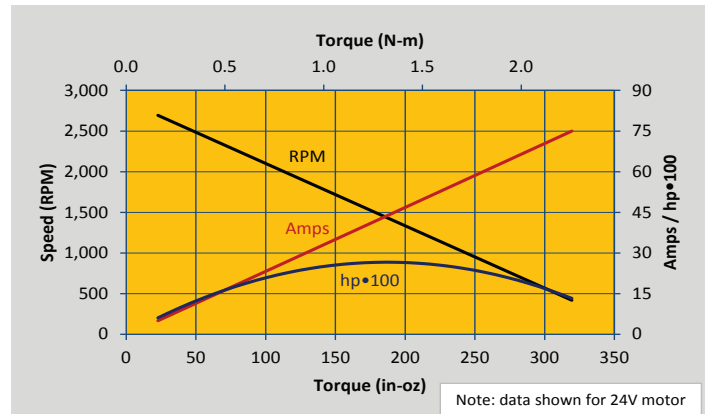
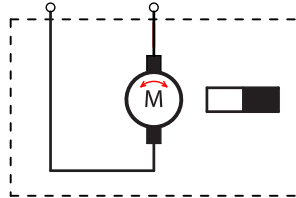
- 83mm (3.29 in)
- 12-24 VDC
- PM field, 2-pole
- 230 W (0.3 hp) max, 1000-2700 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

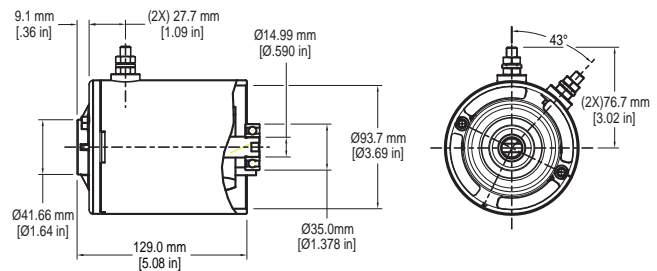
- Pumps
- Braking systems
- Blowers



LLL Family

Description

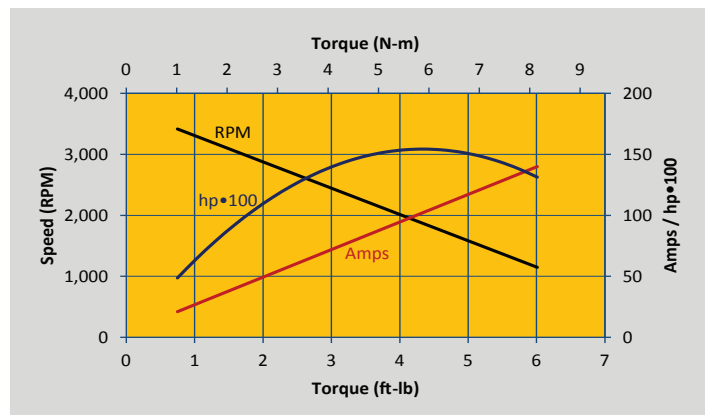
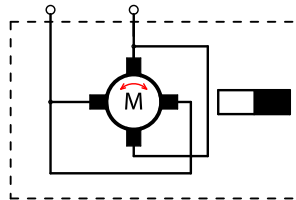
- 102mm (4.0 in)
- 12-48 VDC
- PM field, 4-pole
- 1120 W (1.5 hp) max, 1100-3400 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

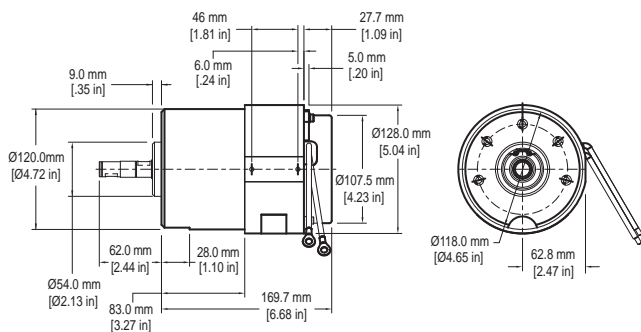
- Pumps and powerpacks
- Controlled motion
- Machine tools



JJJ Family

Description

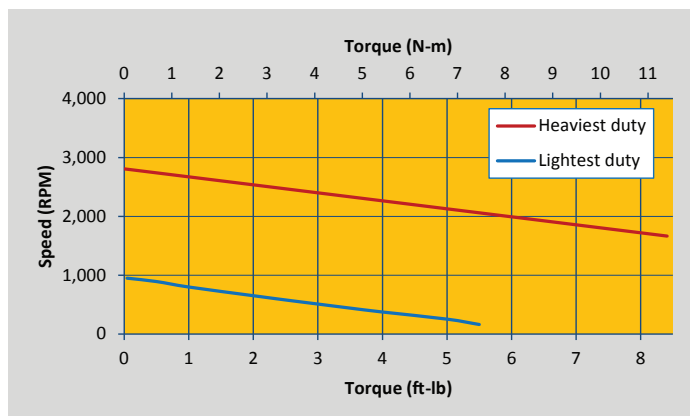
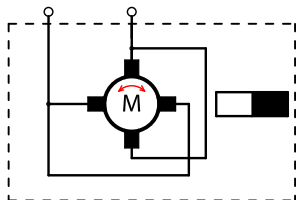
- 120mm (4.72 in)
- 12-24 VDC
- PM field, 4-pole
- 2010 W (2.7 hp) max, 160-2900 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

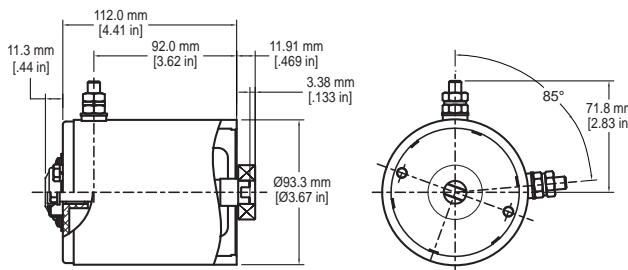
- Water pumps
- Lawn mowers
- Pallet truck drives



MZK Family

Description

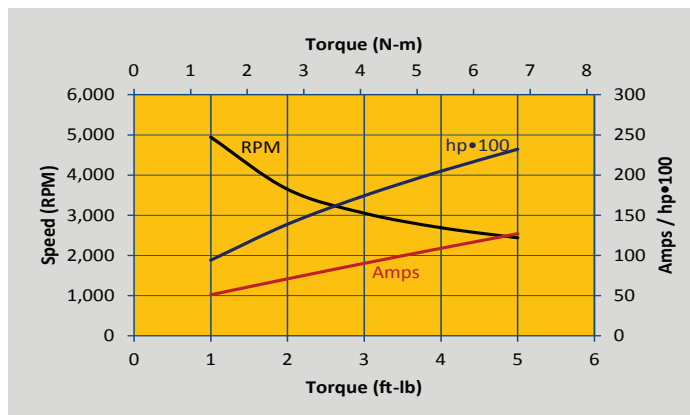
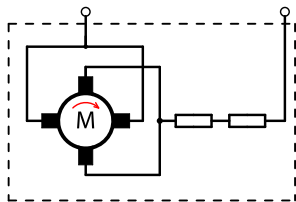
- 93mm (3.67 in)
- 24 VDC
- Series-wound, 4-pole
- 1720 W (2.3 hp) max, 2400-4900 rpm



Reference design shown; customization available upon request.

Typical Applications

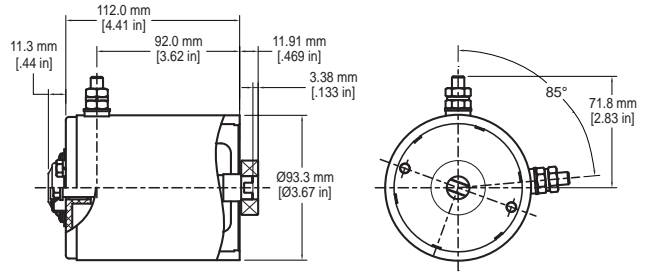
- Pumps and powerpacks
- Agricultural machinery
- RV applications
- Industrial lifts
- Forklifts



MZE Family

Description

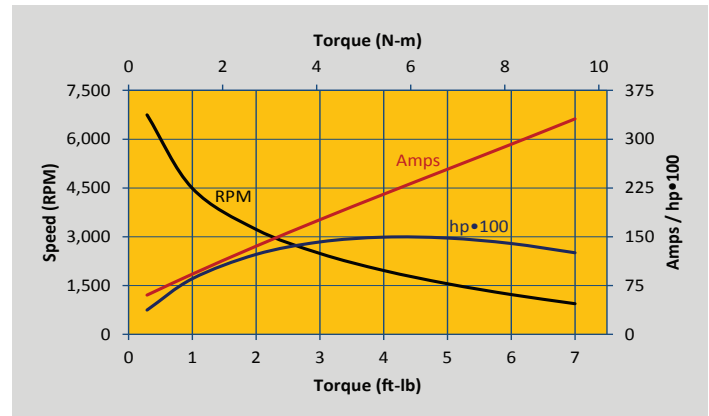
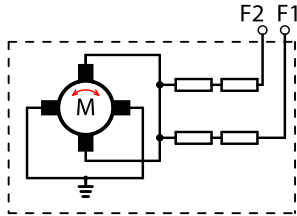
- 93mm (3.67 in)
- 12 VDC
- Series-wound, 4-pole
- 1190 W (1.6 hp) max, 700-6500 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

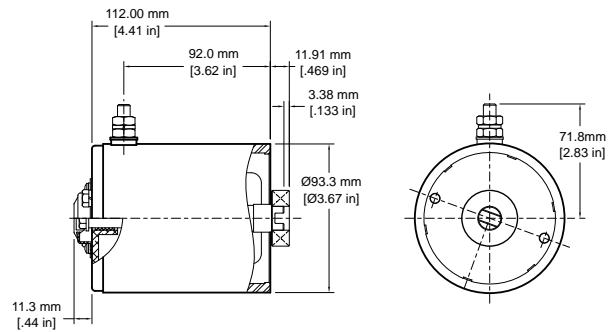
- Pumps and powerpacks
- Agricultural machinery
- RV applications
- Industrial lifts
- Forklifts
- Boat lifts



MZC Family

Description

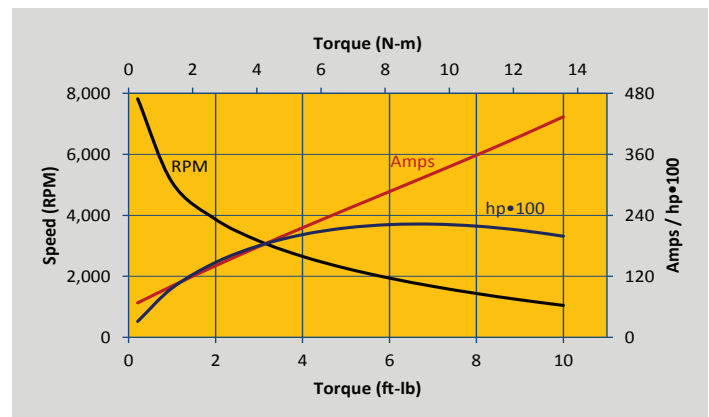
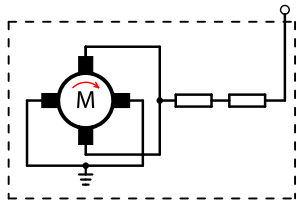
- 93mm (3.67 in)
- 12 VDC
- Series-wound, 4-pole
- 1720 W (2.3 hp) max, 900-5000 rpm



Reference design shown; customization available upon request.

Typical Applications

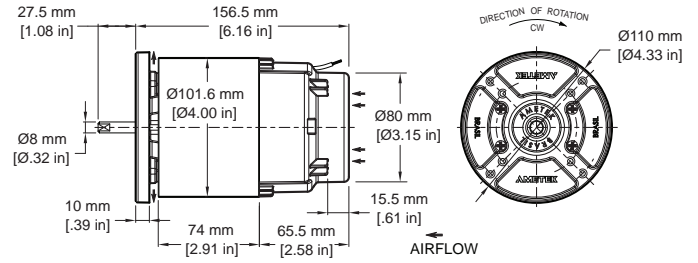
- Pumps and powerpacks
- Agricultural machinery
- RV applications
- Industrial lifts
- Forklifts



SM95 Family

Description

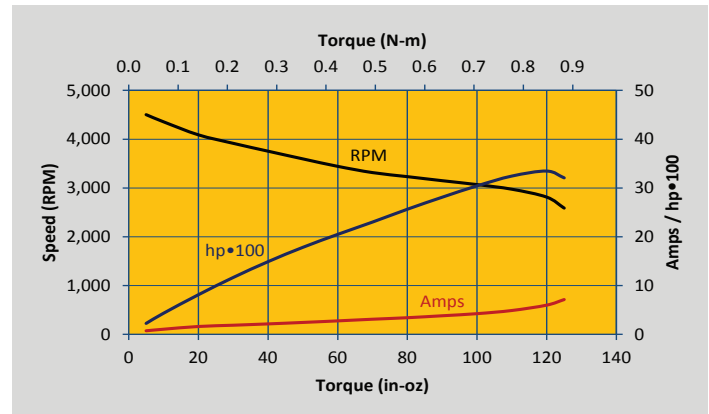
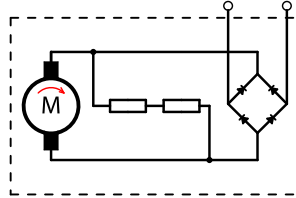
- 95mm (3.74 in)
- 120-240 VAC
- Shunt-wound, 2-pole
- 250 W (0.3 hp) max, 2800-4500 rpm



Reference design shown; customization available upon request.

Typical Applications

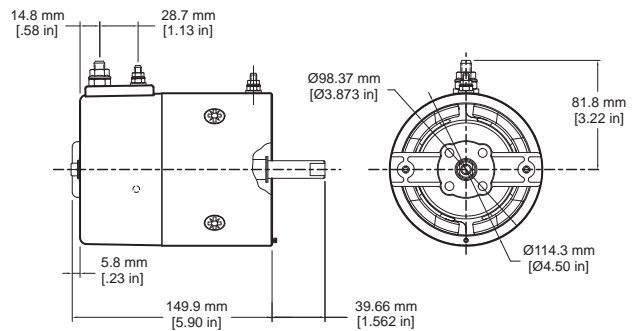
- Compressors
- Grinders
- Lawn mowers
- Mixers and blenders



MXM Family

Description

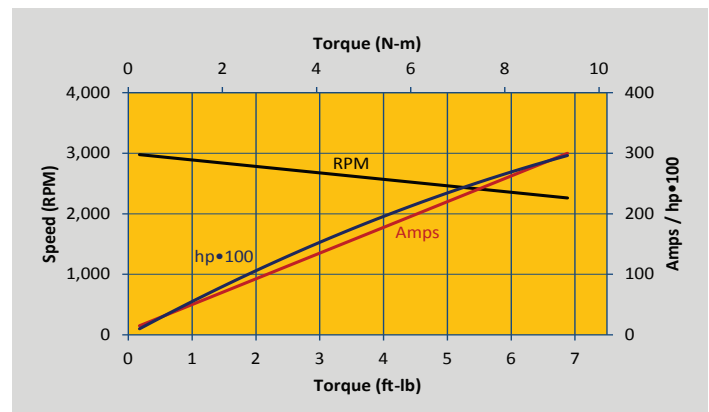
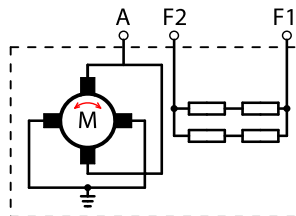
- 114mm (4.50 in)
- 12 VDC
- Shunt-wound, 4-pole
- 2240 W (3.0 hp) max, 2650-3000 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

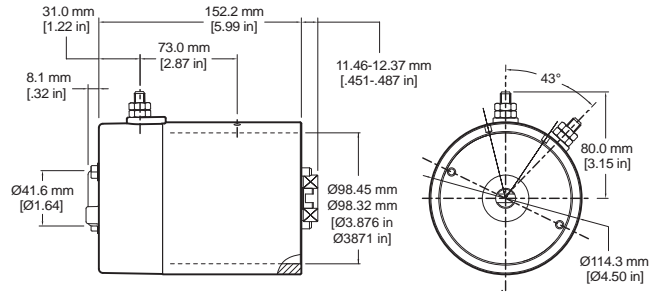
- Pumps and powerpacks
- Winches and hoists
- Speed-controlled applications



MUZ Family

Description

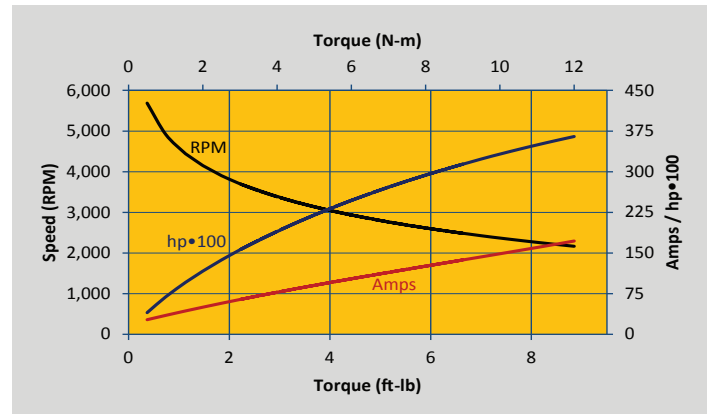
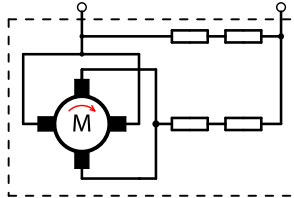
- 114mm (4.50 in)
- 24 VDC
- Compound-wound, 4-pole
- 2680 W (3.6 hp) max, 2200-4600 rpm



Reference design shown; customization available upon request.

Typical Applications

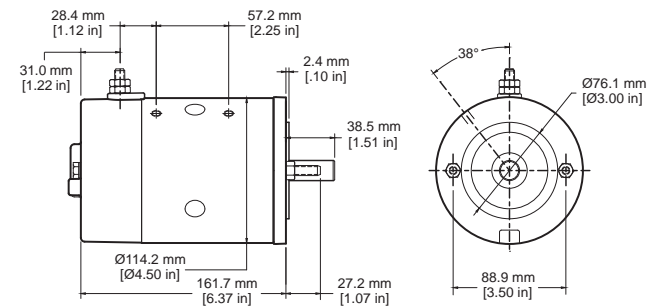
- Pumps and powerpacks
- RV applications
- Forklifts



MEG Family

Description

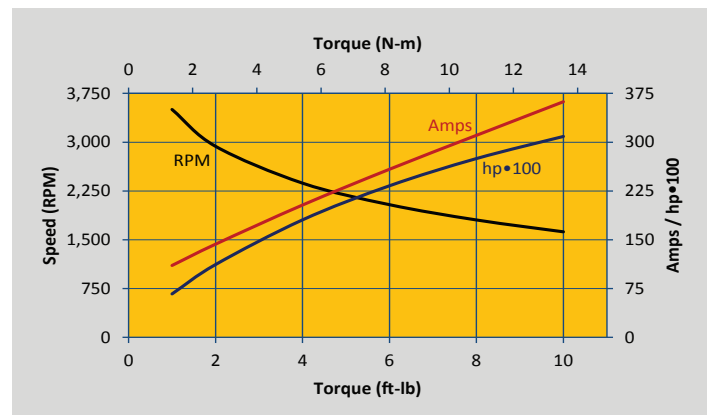
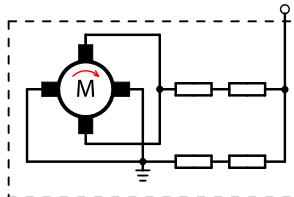
- 114mm (4.50 in)
- 12 VDC
- Compound-wound, 4-pole
- 2240 W (3.0 hp) max, 1600-3400 rpm



Reference design shown; customization available upon request.

Typical Applications

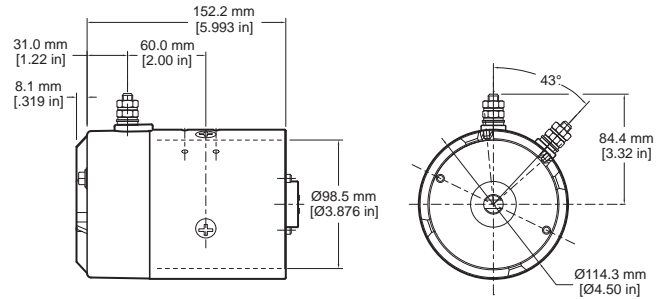
- Pumps and powerpacks
- Agricultural machinery
- Post hole diggers



MUP Family

Description

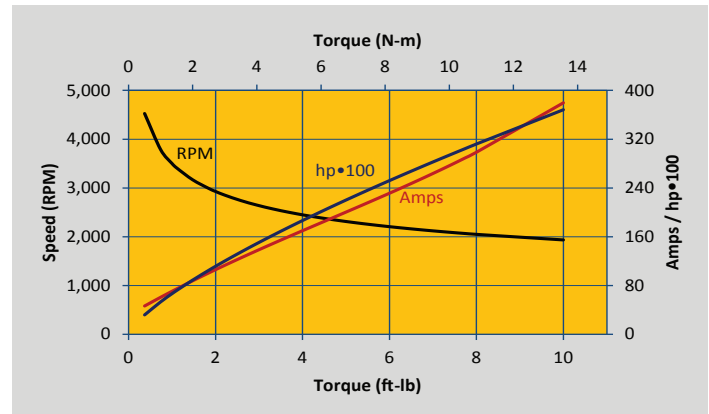
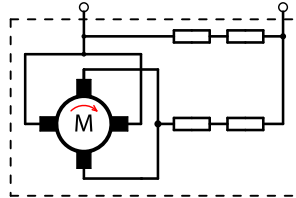
- 114mm (4.50 in)
- 12 VDC
- Compound-wound, 4-pole
- 2680 W (3.6 hp) max, 1800-4400 rpm



Reference design shown; customization available upon request.

Typical Applications

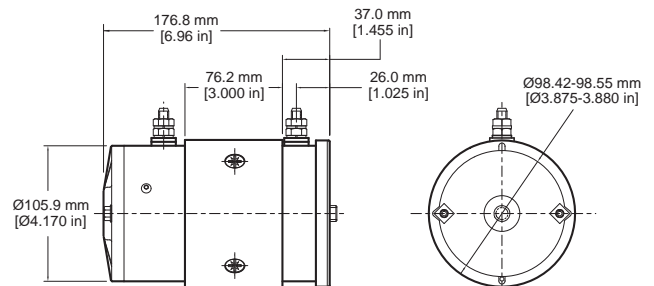
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



MHN Family

Description

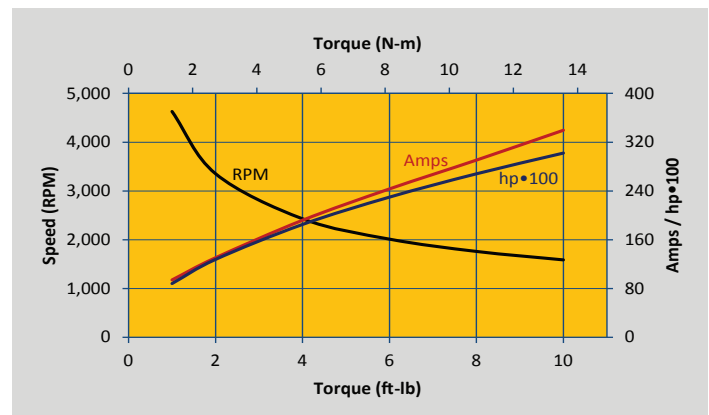
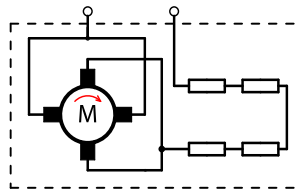
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2240 W (3.0 hp) max, 1600-4600 rpm



Reference design shown; customization available upon request.

Typical Applications

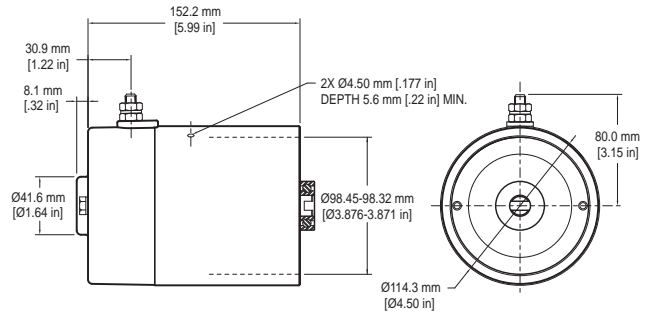
- Pumps and powerpacks
- Tailgate and freight lifts
- Car lifts
- Suspension systems



MUE Family

Description

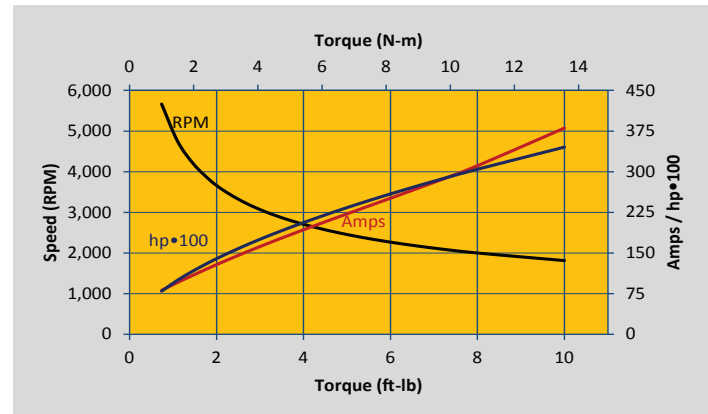
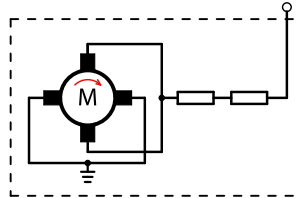
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2540 W (3.4 hp) max, 1700-4600 rpm



Reference design shown; customization available upon request.

Typical Applications

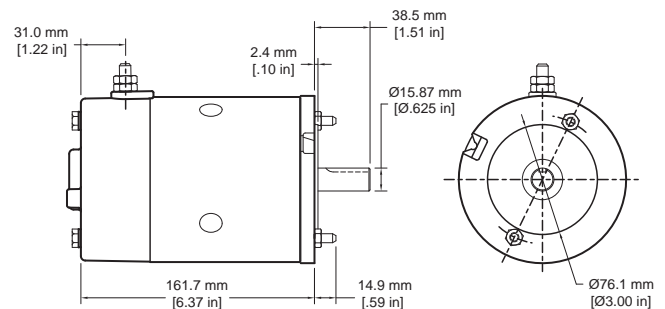
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



MUF Family

Description

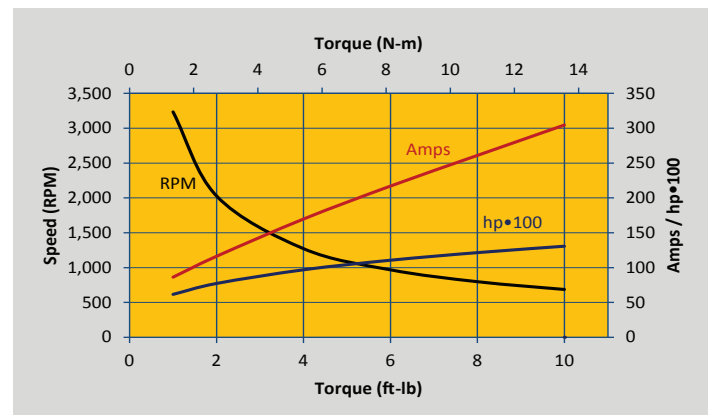
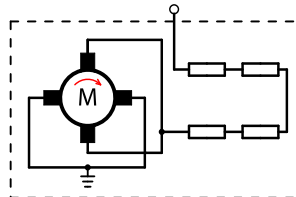
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 970 W (1.3 hp) max, 600-3000 rpm



Reference design shown; customization available upon request.

Typical Applications

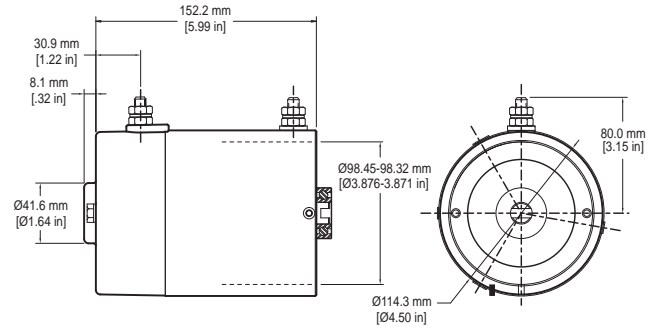
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



MUV Family

Description

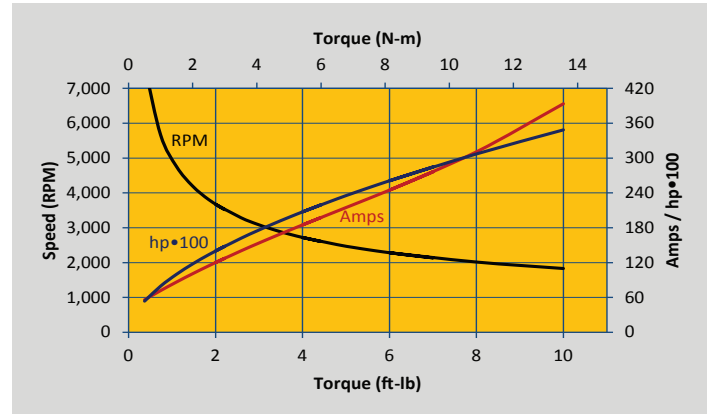
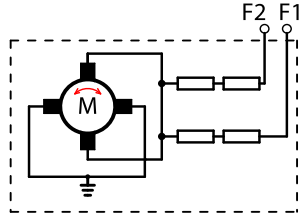
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2540 W (3.4 hp) max, 1600-4800 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

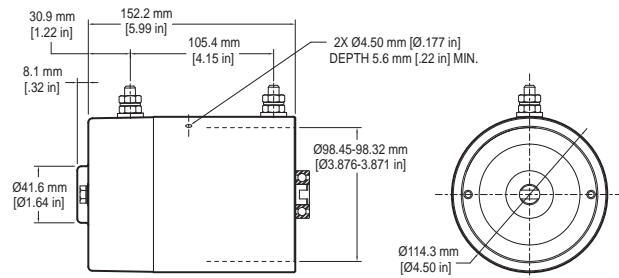
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Winches and hoists
- Snowplows



MUW Family

Description

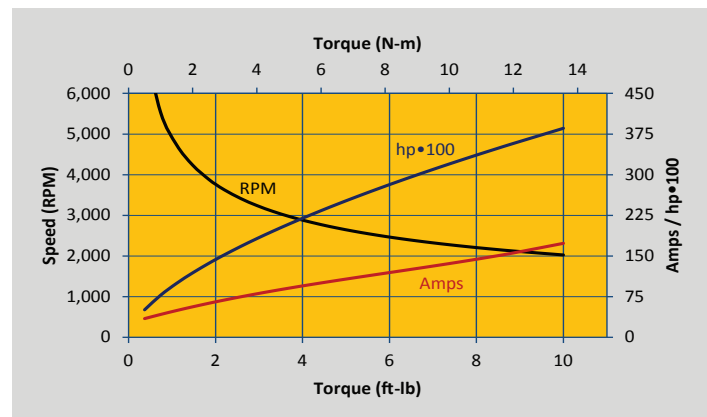
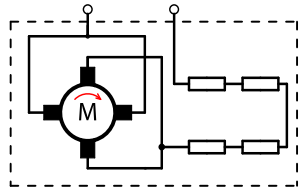
- 114mm (4.50 in)
- 24 VDC
- Series-wound, 4-pole
- 2910 W (3.9 hp) max, 2000-4700 rpm



Reference design shown; customization available upon request.

Typical Applications

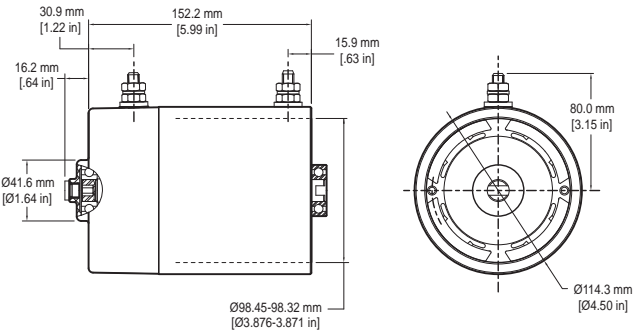
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



MXL Family

Description

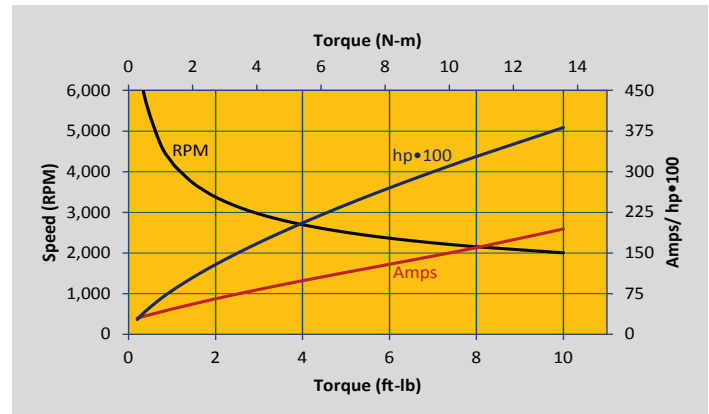
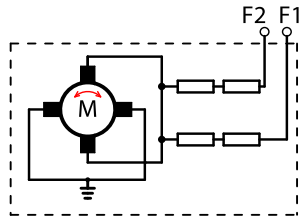
- 114mm (4.50 in)
- 24 VDC
- Series-wound, 4-pole
- 2830 W (3.8 hp) max, 1900-4500 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

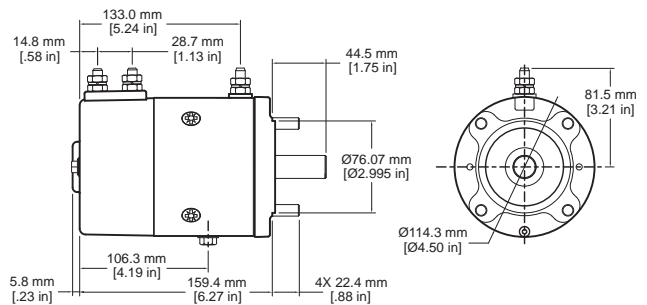
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Winches and hoists
- Snowplows



MBJ Family

Description

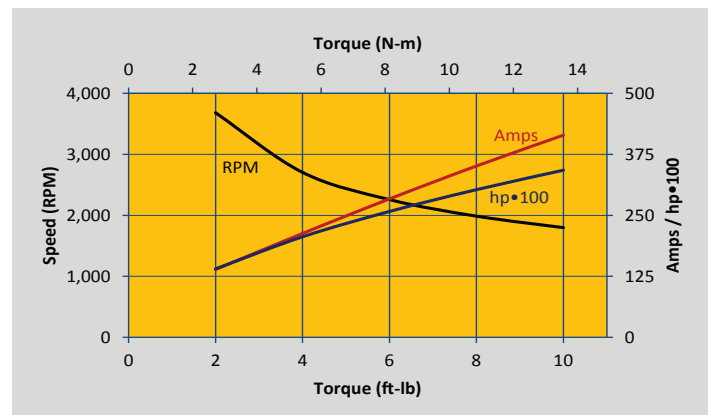
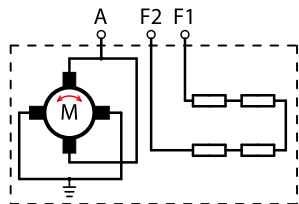
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2540 W (3.4 hp) max, 1700-3600 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

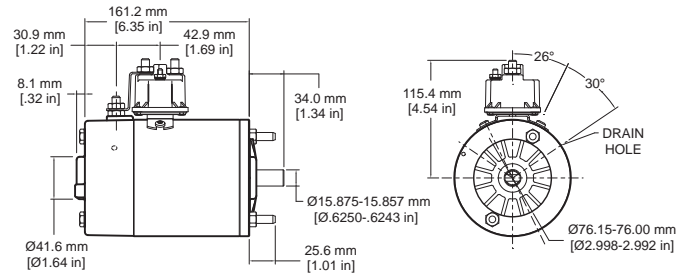
- Winches and hoists
- Marine windlasses
- Anchor hoists



MCW Family

Description

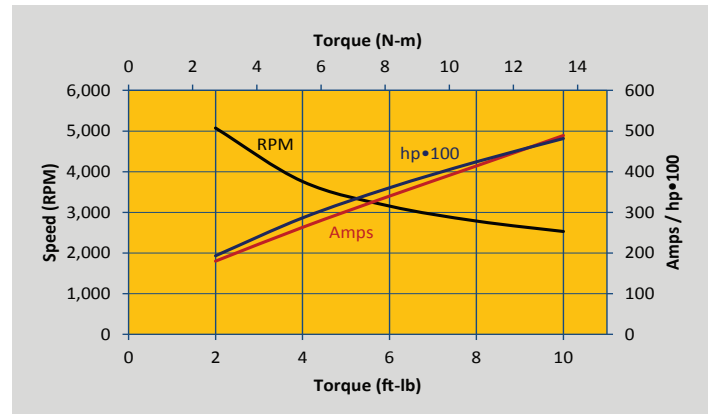
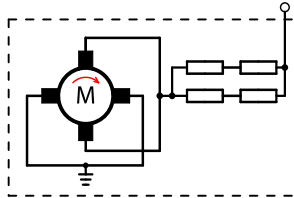
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 3580 W (4.8 hp) max, 2500-5100 rpm



Reference design shown; customization available upon request.

Typical Applications

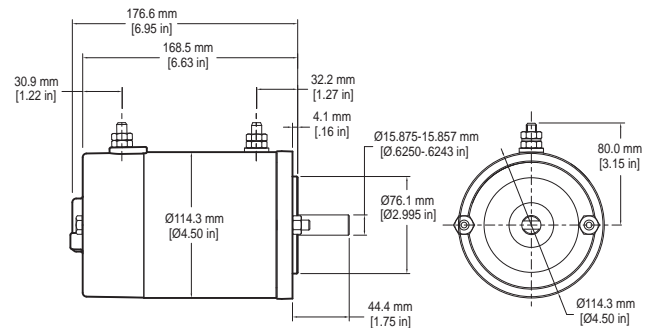
- Pumps and powerpacks
- Water pumps
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



MMQ Family

Description

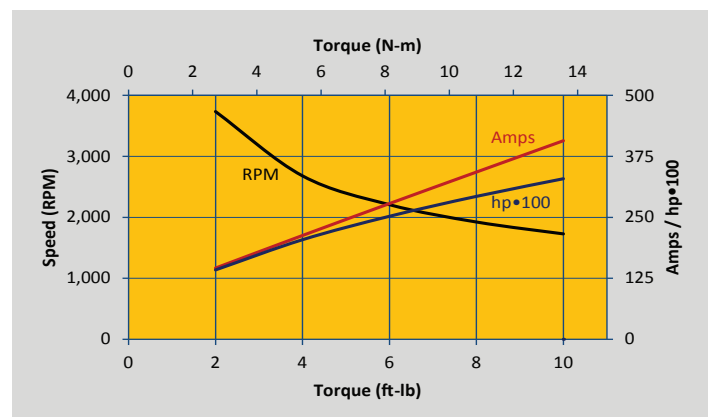
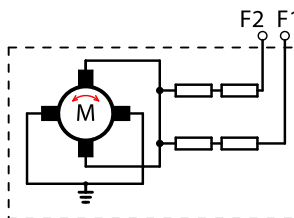
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2460 W (3.3 hp) max, 1700-3700 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

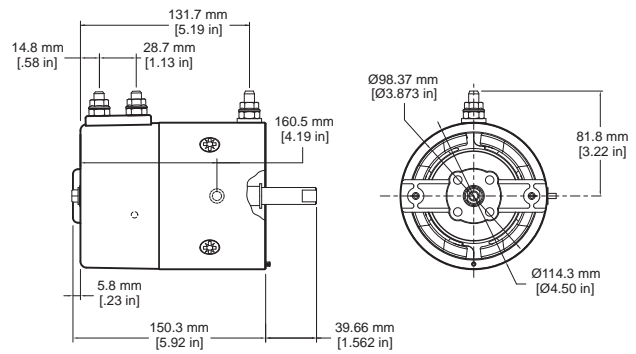
- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Winches and hoists
- Snowplows



MUY Family

Description

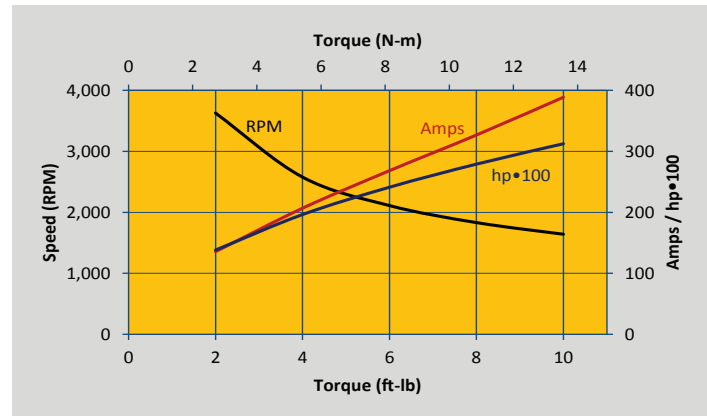
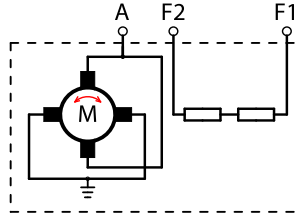
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 2310 W (3.1 hp) max, 1600-3600 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

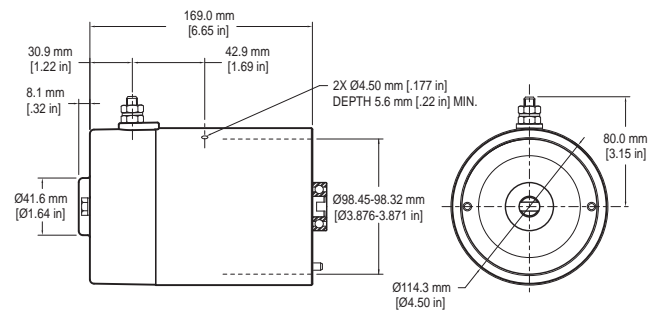
- Pumps and powerpacks
- Marine windlasses
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Winches and hoists
- Snowplows



MMY Family

Description

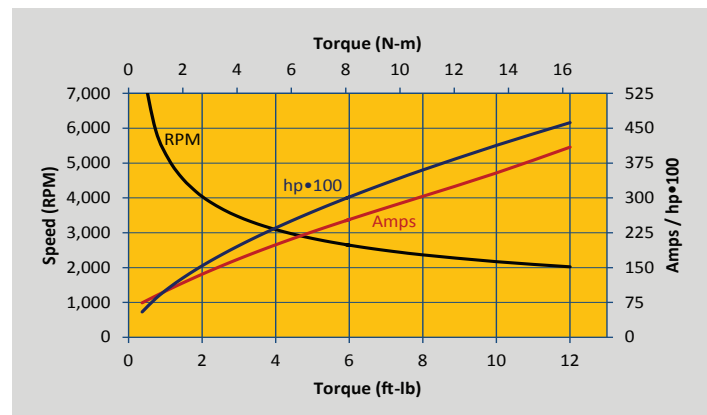
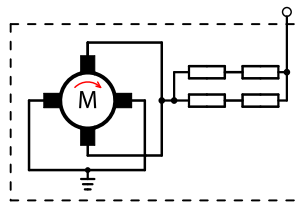
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 3430 W (4.6 hp) max, 1900-5100 rpm



Reference design shown; customization available upon request.

Typical Applications

- Pumps and powerpacks
- Agricultural machinery
- Passenger lifts
- Aerial work platforms
- Tailgate and freight lifts
- Forklifts
- Car lifts
- Snowplows



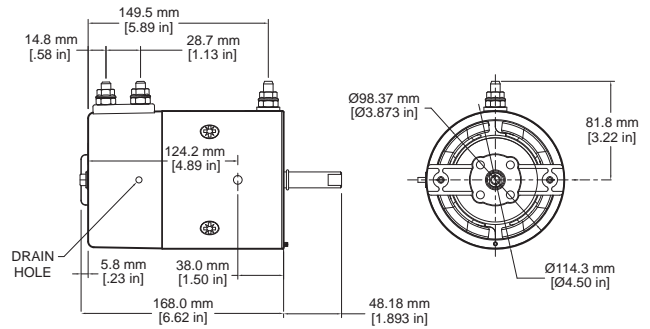
MMW Family

Description

- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 3360 W (4.5 in) max, 1900-3700 rpm
- Reversible rotation

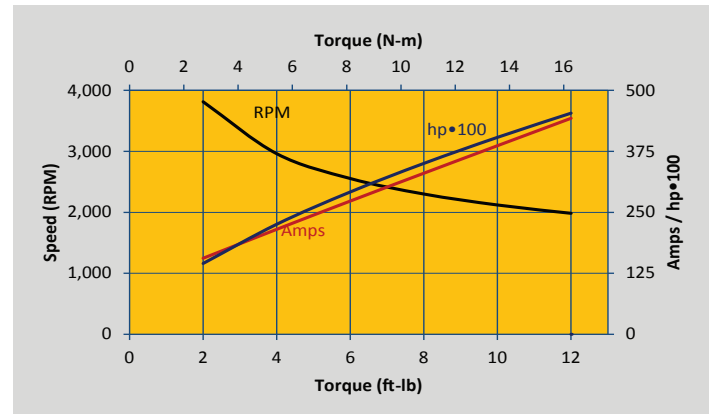
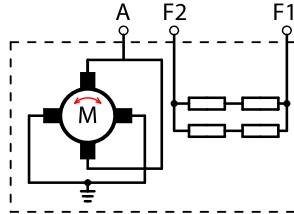


Reference design shown; customization available upon request.



Typical Applications

- Pumps and powerpacks
- Marine windlasses
- Anchor hoists
- Winches and hoists



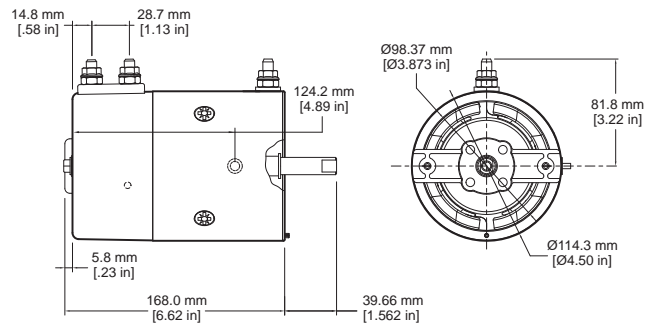
MUQ Family

Description

- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 3130 W (4.2 hp) max, 1800-3800 rpm
- Reversible rotation

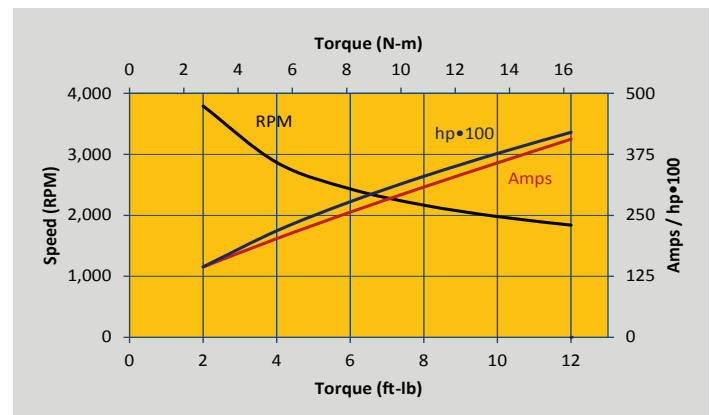
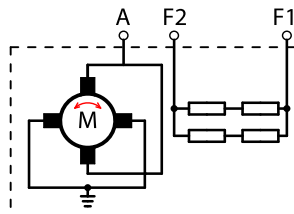


Reference design shown; customization available upon request.



Typical Applications

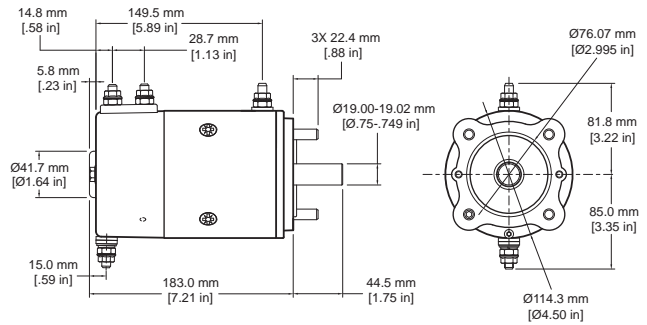
- Pumps and powerpacks
- Marine windlasses
- Anchor hoists
- Winches and hoists



MUR Family

Description

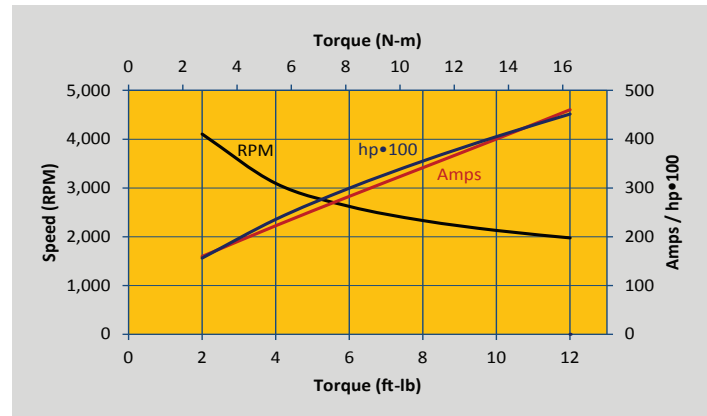
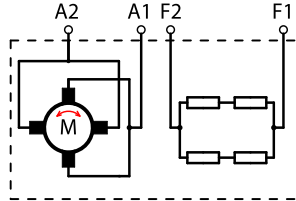
- 114mm (4.50 in)
- 12 VDC
- Series-wound, 4-pole
- 3360 W (4.5 hp) max, 1900-4100 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

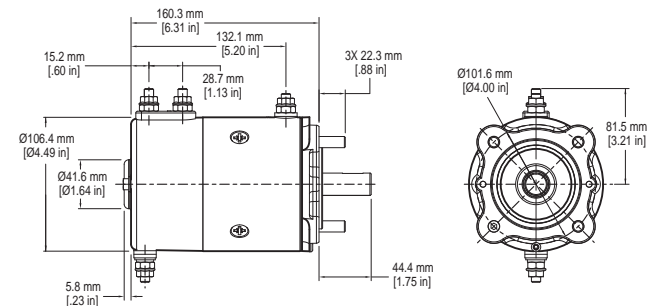
- Winches and hoists
- Marine windlasses
- Anchor hoists



MUX Family

Description

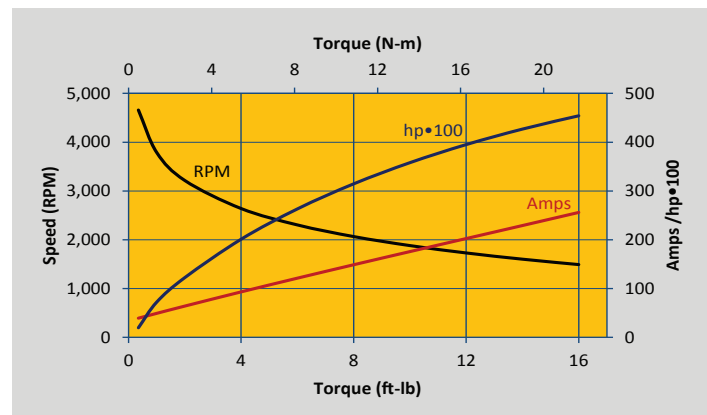
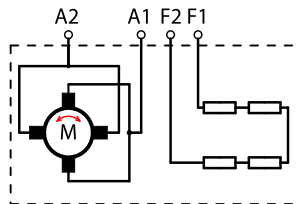
- 114mm (4.50 in)
- 24 VDC
- Series-wound, 4-pole
- 3360 W (4.5 hp) max, 1400-4000 rpm
- Reversible rotation



Reference design shown; customization available upon request.

Typical Applications

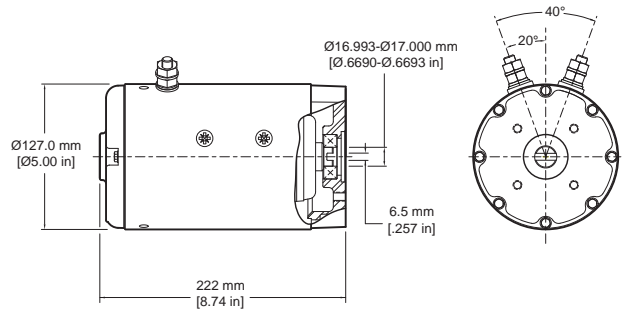
- Winches and hoists
- Marine windlasses
- Anchor hoists



MXN Family

Description

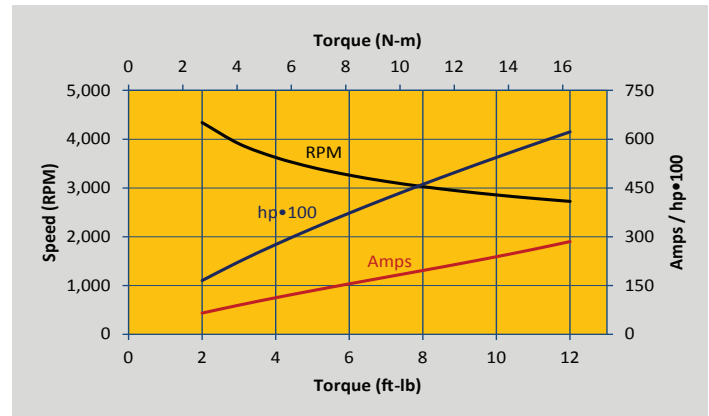
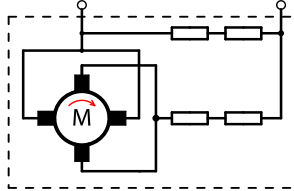
- 127mm (5.00 in)
- 24 VDC
- Compound-wound, 4-pole
- 4620 W (6.2 hp) max, 2700-4300 rpm



Reference design shown; customization available upon request.

Typical Applications

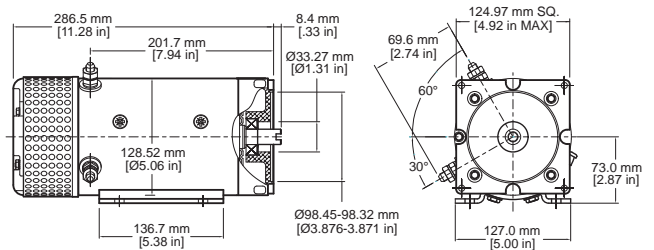
- Pumps and powerpacks
- Agricultural machinery
- Aerial work platforms
- Boom lifts
- Dump trucks and trailers
- Auxiliary steering assist



MBD Family

Description

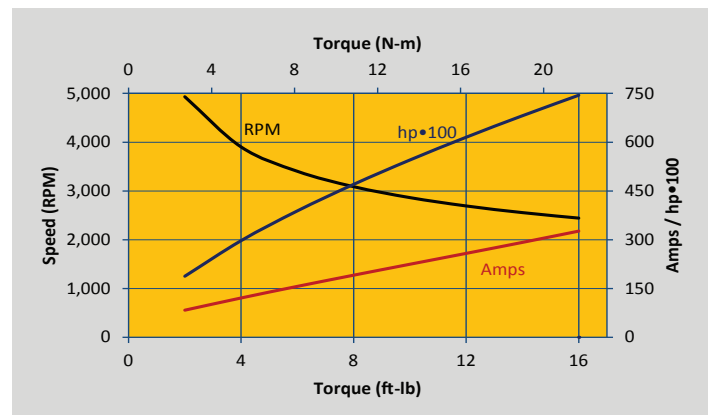
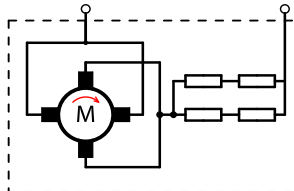
- 127mm (5.00 in)
- 24 VDC
- Series-wound, 4-pole
- 5590 W (7.5 hp) max, 2500-5000 rpm



Reference design shown; customization available upon request.

Typical Applications

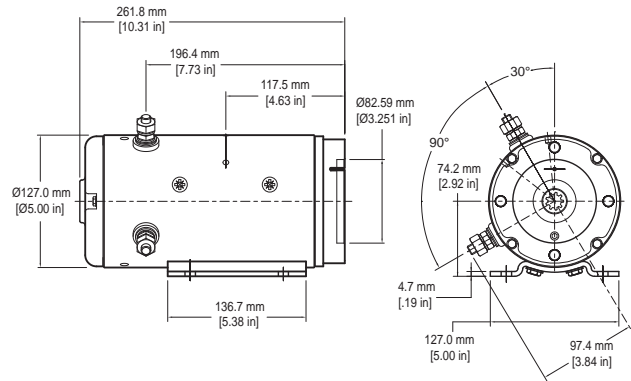
- Pumps and powerpacks
- Agricultural machinery
- Aerial work platforms
- Boom lifts
- Dump trucks and trailers
- Auxiliary steering assist



MFY Family

Description

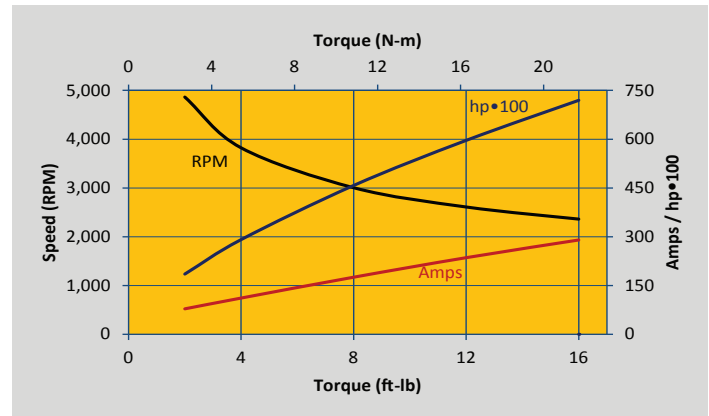
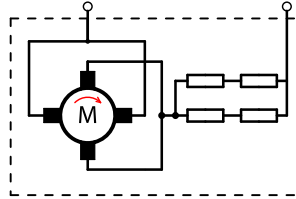
- 127mm (5.00 in)
- 24 VDC
- Series-wound, 4-pole
- 5290 W (7.1 hp) max, 2200-4800 rpm



Reference design shown; customization available upon request.

Typical Applications

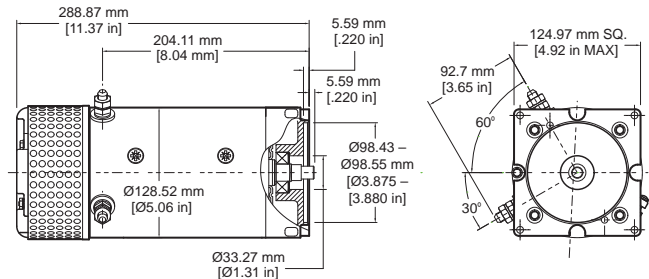
- Pumps and powerpacks
- Agricultural machinery
- Aerial work platforms
- Boom lifts
- Dump trucks and trailers
- Auxiliary steering assist



MMR Family

Description

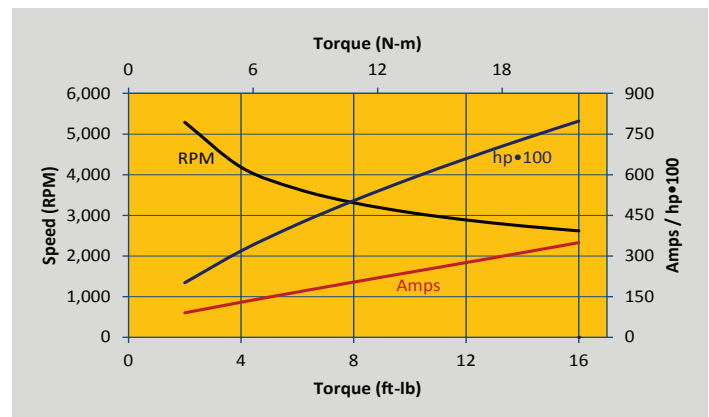
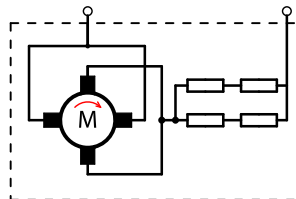
- 127mm (5.00 in)
- 24 VDC
- Series-wound, 4-pole
- 5890 W (7.9 hp) max, 2600-5300 rpm



Reference design shown; customization available upon request.

Typical Applications

- Pumps and powerpacks
- Agricultural machinery
- Aerial work platforms
- Boom lifts
- Dump trucks and trailers
- Auxiliary steering assist



AMETEK Switch Solenoids

Prestolite solenoids from AMETEK Switch are designed to switch the inductive loads of DC motors over a long cycle life. Available in a durable Zn-plated steel case or a water-resistant one-piece molded plastic case (IP67), these switches incorporate a moving disk or leaf spring design using copper or silver contact materials. All switches listed here have single-pole, single-throw (SPST) normally-open (NO) contacts, and include curved mounting brackets for direct attachment to a motor OD.

For motors operating continuously, choose a switch based on the “Carry” current rating. The Carry current of each switch is the continuous load it can carry and keep its terminals at a safe temperature (<65°C).

For motors operating intermittently, choose a switch based on the “Break” current rating. The “Break” current is the load each switch can repetitively open and still achieve its rated cycle life. Steel-case switches are rated for a 50,000 cycle electrical life at full Break current; plastic-case switches for a 60,000 cycle life at full Break current.

AMETEK offers a wide range of standard designs, but will also custom design solenoids to meet specific customer requirements.



Metal Case Solenoids with Curved Brackets for Motor Mounting

Part Number	Coil Voltage	Carry Current (A)	Break Current (A)	Wiring Diagram	Coil Duty	Mounting Bracket	Mounting Slot Width (in)	Coil Resistance (Ω)	Pick-up Voltage	Options	No. of Coil Terminals	Contact Material
SAW-4601	6	100	200	1	I	C	0.22	1.05	4		1	Cu
SAS-4224	12	100	200	2	HDI	C	0.28	4.2	8	R	2	Cu/Ag
SAS-5202B	12	100	200	2	HDI	C	0.22	4.2	8	U	2	Cu
SAS-5202C	12	100	200	2	HDI	C	0.28	4.2	8	U	2	Cu
SAS-5202D	12	100	200	2	HDI	C	0.28	4.2	8	U	2	Cu
SAS-5202E	12	100	200	2	HDI	C	0.28	4.2	8	U, R	2	Cu
SAS-4211Y	12	100	200	4	HDI	C	0.22	4.2	8	MA	2	Cu
SAS-4215	12	100	200	4	HDI	C	0.22	4.2	8	R	2	Cu
SAW-4201	12	100	200	1	I	C	0.22	4	8		1	Cu
SAW-4210Y	12	100	200	1	I	C	0.22	4	8	MA	1	Cu
SAW-4214	12	100	200	1	I	C	0.22	4	8	R	1	Cu
SAW-4227	12	100	200	1	I	C	0.28	4	8		1	Cu
SAW-4228	12	100	200	1	I	C	0.28	4	8	R	1	Cu
SAW-4230	12	100	200	1	I	C	0.28	4	8		1	Cu
SAW-4203	12	100	200	2	I	C	0.22	4	8		2	Cu
SAW-4225	12	100	200	2	I	C	0.28	4	8		2	Cu
SAW-5203	12	100	200	2	I	C	0.22	4	8	U	2	Cu
SAW-5229	12	100	200	2	I	C	0.28	4	8	U	2	Cu
SAW-4211	12	100	200	3	I	C	0.28	4	8		1	Cu
SAW-4218	12	100	200	3	I	C	0.22	4	8		1	Cu
SAS-5201B	12	200	300	2	C	C	0.22	14.5	9	U	2	Cu/Ag
SAS-5201C	12	200	300	2	C	C	0.28	14.5	9	U	2	Cu/Ag
SAS-4221	12	200	300	1	HDI	C	0.28	4.2	8	R	1	Cu/Ag
SAS-5403C	24	100	150	2	C	C	0.28	54	18	U	2	Cu
SAS-5402C	24	100	150	2	HDI	C	0.28	16.8	16	U	2	Cu
SAS-5402D	24	100	150	2	HDI	C	0.28	16.8	16	U	2	Cu
SAS-5402E	24	100	150	2	HDI	C	0.28	16.8	16	U, R	2	Cu
SAS-5402F	24	100	150	2	HDI	C	0.28	16.8	16	U	2	Cu
SAW-4401	24	100	150	1	I	C	0.22	16.8	16		1	Cu
SAW-4414	24	100	150	1	I	C	0.28	16.8	16		1	Cu
SAS-5402B	24	100	150	2	I	C	0.22	16.8	16	U	2	Cu
SAW-4416	24	100	150	2	I	C	0.28	16.8	16		2	Cu
SAW-5418	24	100	150	2	I	C	0.28	16.8	16	U	2	Cu
SAW-4402	24	100	150	3	I	C	0.22	16.8	16		1	Cu
SAS-4408	24	200	250	2	C	C	0.22	54	18		2	Cu/Ag
SAS-5401B	24	200	250	2	C	C	0.28	54	18	U	2	Cu/Ag

LEGENDS:

COIL DUTY -

I = Intermittent Duty
 2-minute max ON-time, 25% duty cycle
HDI = Heavy Duty Intermittent
 10-minute max ON-time, 25% duty cycle
C = Continuous Duty

OPTIONS -

R = Splash Resistant
U = UL Recognized
MA = Marineized
ME = Metric Terminals
F = Diode on Coil

CONTACT MATERIALS -

Cu = Copper
Ag = Silver

Plastic Case Solenoids with Curved Brackets for Motor Mounting

Part Number	Coil Voltage	Carry Current (A)	Break Current (A)	Wiring Diagram	Coil Duty	Mounting Bracket	Mounting Slot Width (in)	Coil Resistance (Ω)	Pick-up Voltage	Options	No. of Coil Terminals	Contact Material
SBC-4201AC	12	100	200	1	C	C	0.28	15.5	8.5		1	Cu
SBC-4201AG	12	100	200	1	C	LC	0.28	15.5	8.5		1	Cu
SBC-4201AS	12	100	200	1	C	LC	0.28	10	8.5		1	Cu-Cd
SBC-4201AF	12	100	200	2	C	C	0.28	15.5	8.5		2	Cu
SBC-4201AH	12	100	200	2	C	LC	0.28	15.5	8.5		2	Cu
SBC-4201AP	12	100	200	2	C	LC	0.28	10	8.5		2	Cu-Cd
SAZ-4201BJ	12	100	200	1	HDI	C	0.28	4.1	9		1	Cu-Cd
SAZ-4201FY	12	100	200	1	HDI	C	0.22	4.1	9		1	Cu-Cd
SAZ-4201ER	12	100	200	2	HDI	C	0.28	4.1	9		2	Cu
SAZ-4201GJ	12	100	200	2	HDI	C	0.22	4.1	9		2	Cu-Cd
SAZ-4201GK	12	100	200	2	HDI	LC	0.28	4.1	9		2	Cu-Cd
SAZ-4201HF-M	12	100	200	2	HDI	C	0.22	4.1	9	ME	2	Cu-Cd
SAZ-4201AG	12	100	200	4	HDI	C	0.28	4.1	9		2	Cu-Cd
SAZ-4201AGY	12	100	200	4	HDI	C	0.28	4.1	9	MA	2	Cu-Cd
SAZ-4201GH	12	100	200	7	HDI	LC	0.28	2.9	8.8	F	2	Cu-Cd
SAZ-4201FP	12	100	200	1	I	C	0.28	3	6		1	Cu-Cd
SAZ-4201GF	12	100	200	1	I	LC	0.28	3	6		1	Cu-Cd
SAZ-4201GC	12	100	200	2	I	C	0.28	3	6		2	Cu-Cd
SBJ-4255	12	200	200	2	C	LC	0.28	12	8		2	Cu
SBJ-5255	12	200	200	2	C	LC	0.28	12	8	U	2	Cu
SBJ-6255	12	200	200	2	C	LC	0.28	12	8		2	Cu/Ag
SBC-4401H	24	100	150	1	C	LC	0.28	58.3	18		1	Cu
SBC-4401J	24	100	150	2	C	LC	0.28	58.3	18		2	Cu
SAZ-4401AK	24	100	150	1	HDI	C	0.22	14.3	18		1	Cu
SAZ-4401G	24	100	150	1	HDI	C	0.28	14.3	18		1	Cu-Cd
SAZ-4401AM	24	100	150	2	HDI	C	0.22	14.3	18		2	Cu-Cd
SAZ-4401AL	24	100	150	7	HDI	LC	0.28	14.3	18	F	2	Cu-Cd
SAZ-4401AC	24	100	150	2	I	C	0.28	10.7	16		2	Cu-Cd
SAZ-4401AG	24	100	150	2	I	LC	0.28	10.7	16		2	Cu-Cd
SAZ-4401AJ	24	100	150	2	I	C	0.22	10.7	16		2	Cu-Cd
SAZ-4401AS-M	24	100	150	2	I	C	0.22	10.7	16	ME	2	Cu-Cd
SBJ-5455	24	200	200	2	C	LC	0.28	41	15.5	U	2	Cu
SBJ-6455	24	200	200	2	C	LC	0.28	41	15.5		2	Cu/Ag

LEGENDS:

COIL DUTY –

I = Intermittent Duty
 2-minute max ON-time, 25% duty cycle
HDI = Heavy Duty Intermittent
 10-minute max ON-time, 25% duty cycle
C = Continuous Duty

OPTIONS –

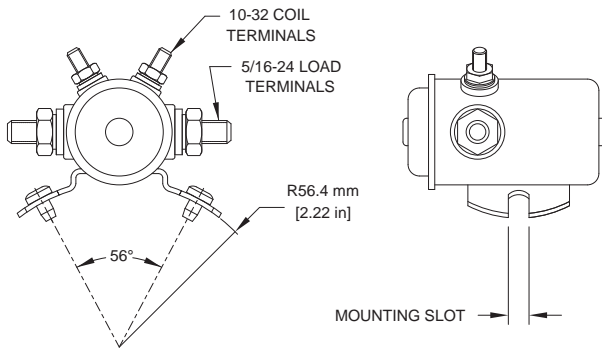
R = Splash Resistant
U = UL Recognized
MA = Marinized
ME = Metric Terminals
F = Diode on Coil

CONTACT MATERIALS –

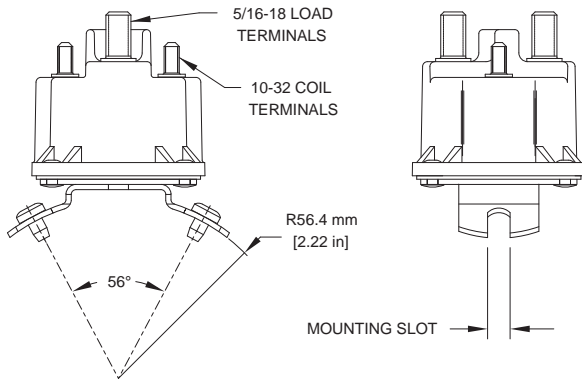
Cu = Copper
Cu-Cd = Copper, Cadmium plated
Ag = Silver

Outline Drawings

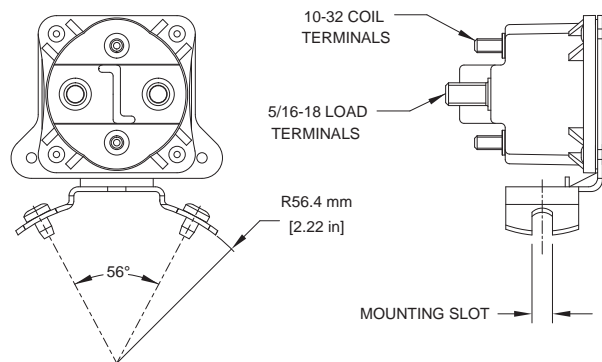
METAL CASE SWITCH WITH "C" BRACKET



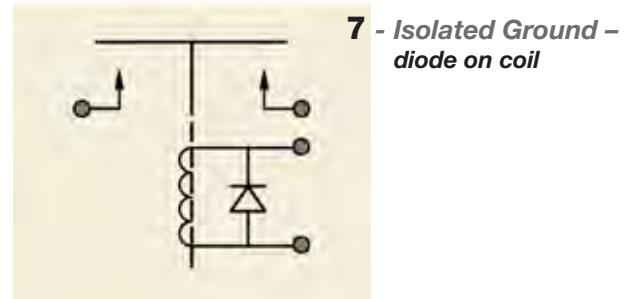
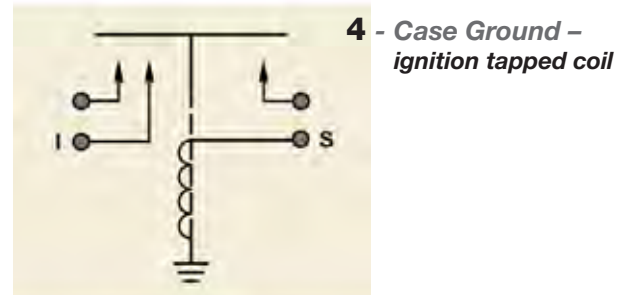
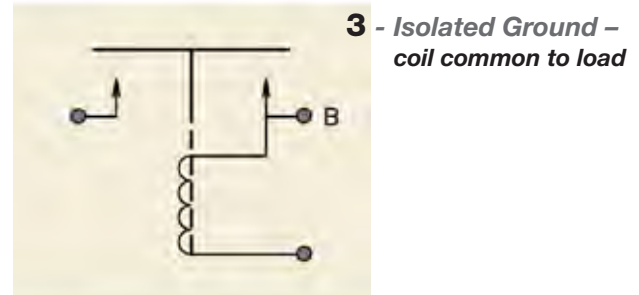
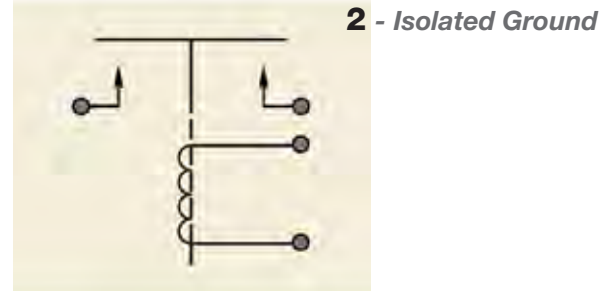
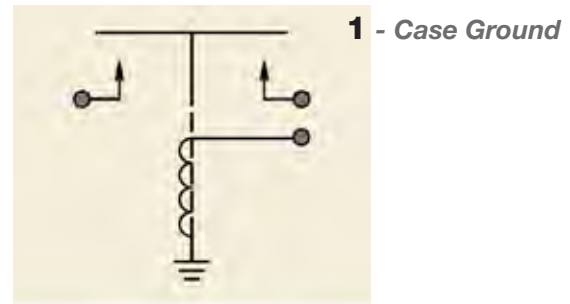
PLASTIC CASE SWITCH WITH "C" BRACKET



PLASTIC CASE SWITCH WITH "LC" BRACKET



Wiring Diagrams



Customer Requirements Questionnaire

Customer:

Customer motor PN:

Competitor:

Application:

Target market region:

Standard AMETEK product for ref:

Replacement or new development:

Rated Load Point

Voltage:	<input type="text"/>	VDC
Current:	<input type="text"/>	Amps
Torque:	<input type="text"/>	N-m ft-lb
Pump displacement:	<input type="text"/>	cc/rev in ³ /rev
Oil pressure:	<input type="text"/>	bar psig
Duty cycle:	<input type="text"/>	min, S2 %, S3

Output power:	<input type="text"/>	Watts hp
Speed:	<input type="text"/>	RPM
Flowrate:	<input type="text"/>	lpm gpm
Expected life:	<input type="text"/>	cycles hrs

2nd Load Point

Voltage:	<input type="text"/>	VDC
Current:	<input type="text"/>	Amps
Torque:	<input type="text"/>	N-m ft-lb
Oil pressure:	<input type="text"/>	bar psig

Output power:	<input type="text"/>	Watts hp
Speed:	<input type="text"/>	RPM
Flowrate:	<input type="text"/>	lpm gpm

3rd Load Point

Voltage:	<input type="text"/>	VDC
Current:	<input type="text"/>	Amps
Torque:	<input type="text"/>	N-m ft-lb
Oil pressure:	<input type="text"/>	bar psig

Output power:	<input type="text"/>	Watts hp
Speed:	<input type="text"/>	RPM
Flowrate:	<input type="text"/>	lpm gpm

Mechanical Details

IP rating:

Rotation, viewed from output end: CW
 CCW

Has a mechanical drawing been provided? yes
 no

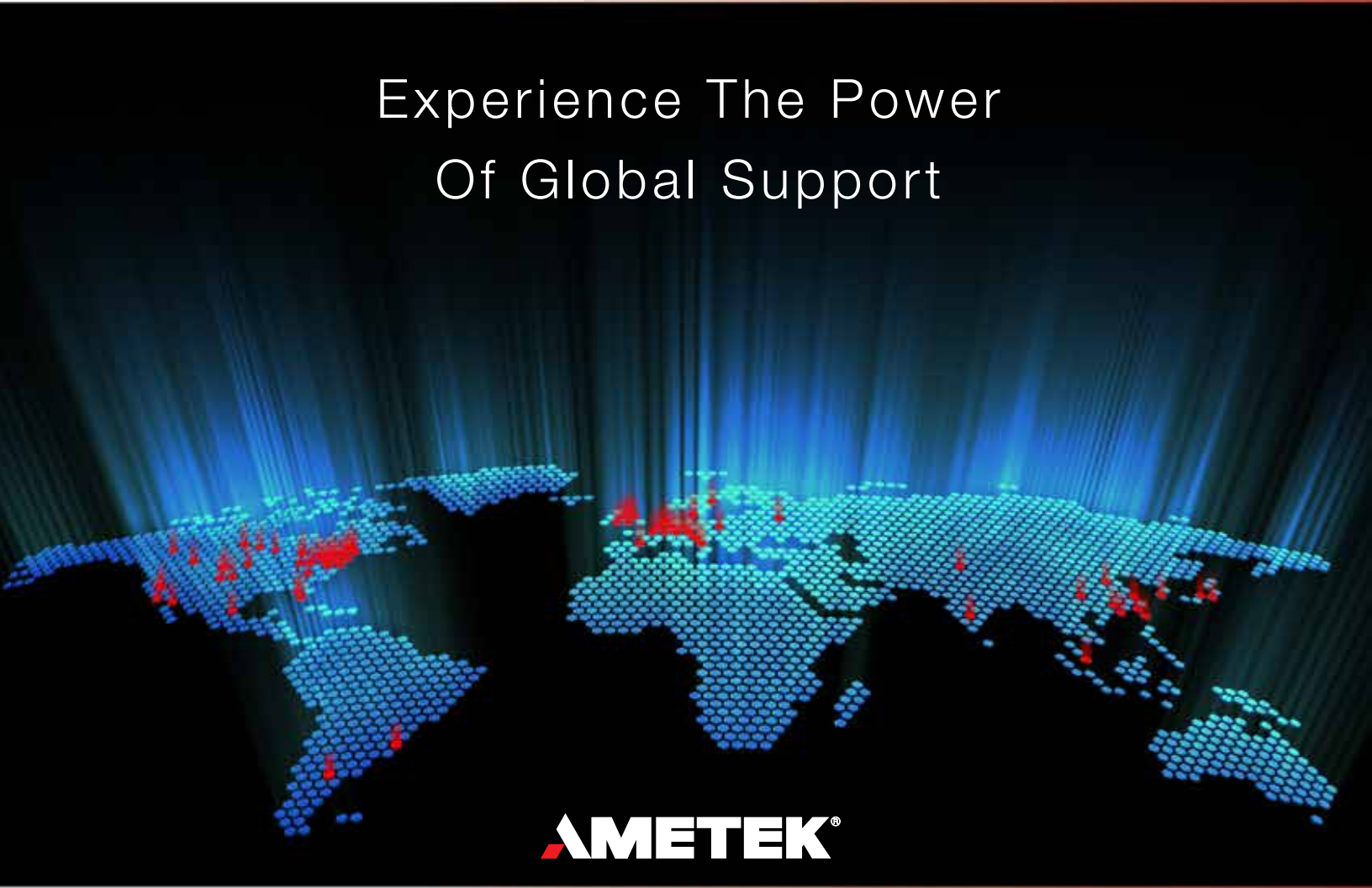
Vibration requirement:

Noise requirement:

OTHER REQUIREMENTS:



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