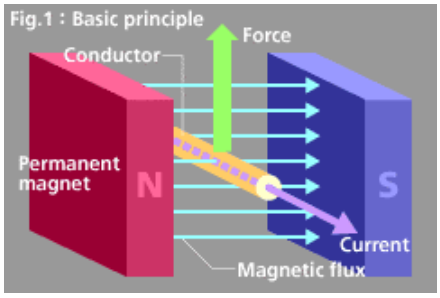
EVERCOM®

DC MICRO MOTORS

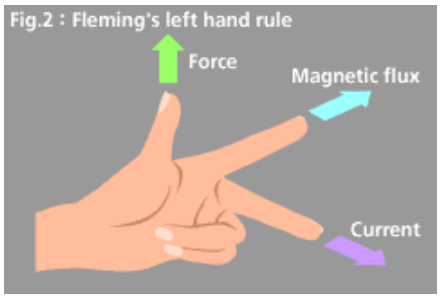
Basic Knowledge of Electromagnetic Force

Electromagnetic Force

The direction of magnetic flux produced by a permanent magnet is always from N-pole to S-pole. When a conductor is placed in a magnetic field and current flows in the conductor, the magnetic field and the current interact each other to produce force. The force is called "Electromagnetic force".

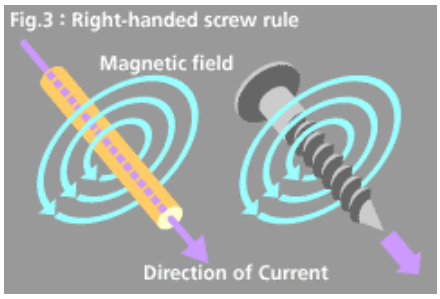


The fleming's left hand rule determines the direction of the current, the magnetic force and the flux. Stretch the thumb, the index finger and the middle finger of your left hand as shown in Fig. 2. When the middle finger is the current and the index finger the magnetic flux, the direction of the force is given by the thumb.



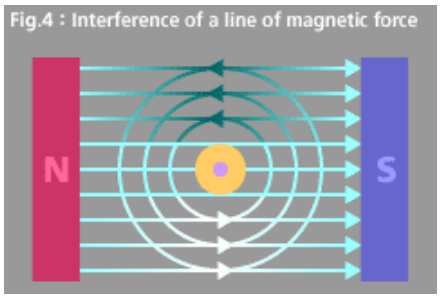
Magnet field produced by current

The magnetic fields produced by the current and the permanent magnets works to produce electromagnetic force. When the current flows in the conductor toward the reader, the magnetic field in the CCW direction will be produced around the current flow by the right-handed screw rule.



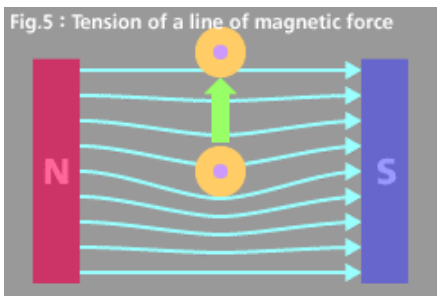
Interference of a line of magnetic force

The magnetic fields produced by the current and the permanent magnets interfere each other. The line of magnetic force distributed in the same direction acts to increase its strength, while the flux distributed in the opposite direction acts to reduce its strength.



Electromagnetic force production

The line of magnetic force has a nature to return to the straight line by its tension like an elastic band. Thus, the conductor is forced to move from where the magnetic force is stronger to where it is weaker.



Torque production

Electromagnetic force is obtained from the equation;

$$F = B \cdot I \cdot \ell$$

F: force; B: magnetic flux density; I: current; ℓ: length of conductor

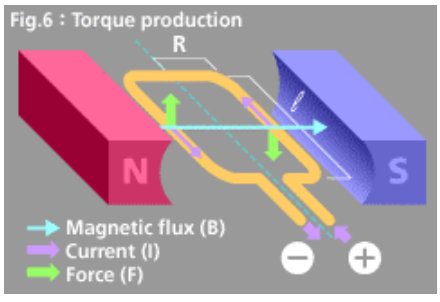


Fig.6 illustrates the torque obtained when a single-turn conductor is placed in the magnetic filed. The torque produced by the single conductor is obtained from the equation;

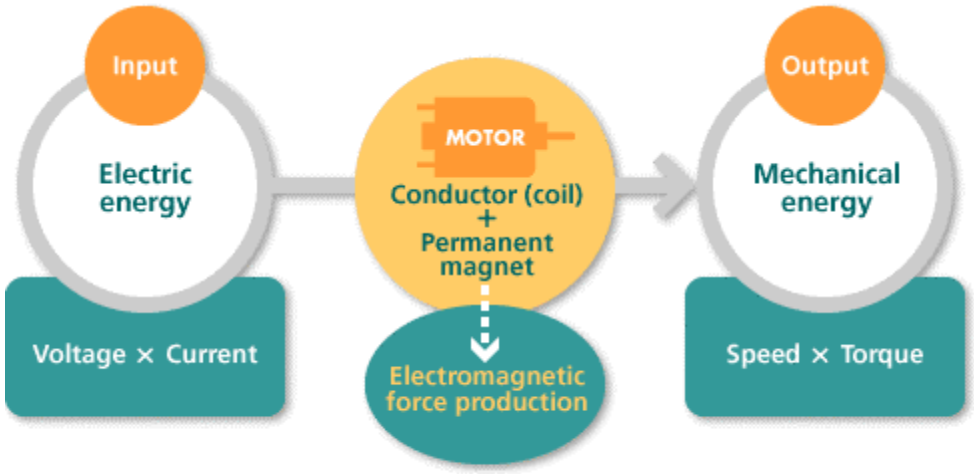
$T' = F \cdot R$

- **T'** (torque)
- **F** (force)
- **R** (distance from the center conductor)

Here, there are 2 conductors present.

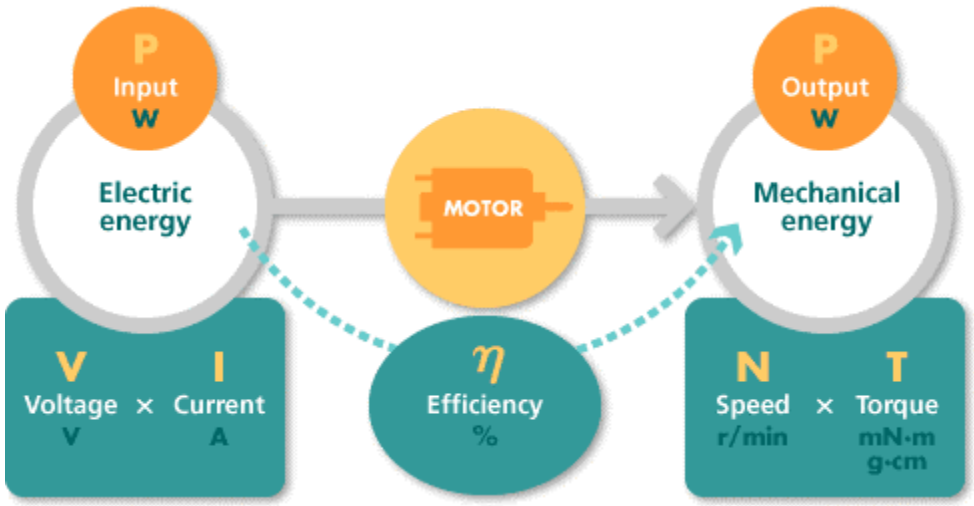
$T = 2 \cdot T' = 2 \cdot F \cdot R$

About Motor



A motor is a rotating machine
that converts electric energy into mechanical energy.

Basic Knowledge of Motor Performance



List of terms on motor performance

Term	Symbol	Unit
Input	P	W
Output	P	W
Maximum output	Pmax.	W
Voltage	V	V
Current	I	A
No-load current	I0	A
Stall current	Is	A
Efficiency (*1)	η	%
Maximum efficiency	ηmax.	%
Speed	N	r/min (*2)
No-load speed	N0	r/min
Torque	T	mN·m, g·cm
Stall torque	Ts	mN·m, g·cm

Various symbols and units are used to indicate motor performance. The figure provided above classifies them by input (electric energy) and output (mechanical energy). See the list on the left for the details.

(*1) It indicates what percentage of the electric energy applied to the motor is used effectively as the mechanical energy.
(*2) It means "revolutions per minute".

Motor Types, Brush Materials and Sizes

This content shows the types of our motors. Our motor type code is based on the classification shown in this content.

Motor-housing Shape

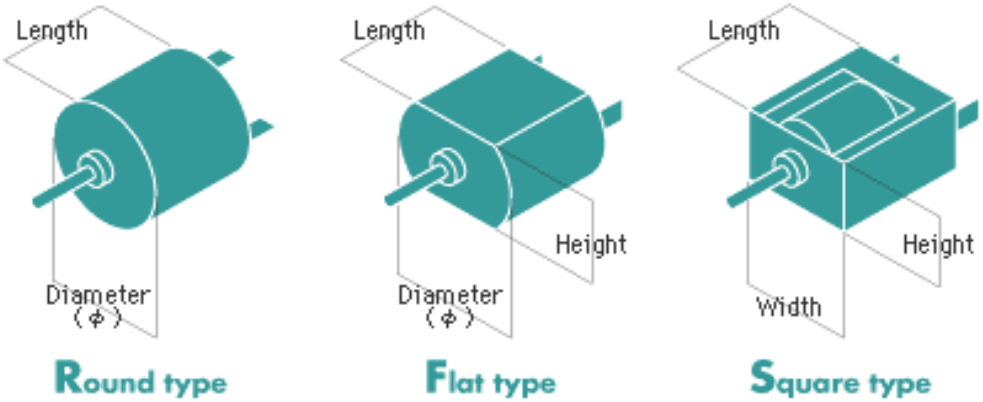
Our motors are classified into three types by the motor-housing shapes of "Round type", "Flat type" and "Square type".

Round type

Flat type

Square type

Size indication of each type is as follows.



Brush Materials

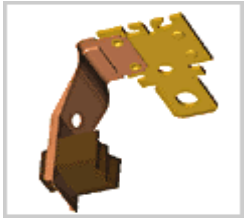
Brush is classified by the materials of the portion that has slide-contact with a commutator.

Metal Brush

The brush that integrates with a terminal easily and used mostly for our economical models. Also named sheet brush.

Precious Metal Brush

The brush for which special precious metal is employed at the slide-contact portion with the commutator, and mainly used for our motors with low current and low output under low voltage. Also named a fork brush by its shape.



Carbon Brush

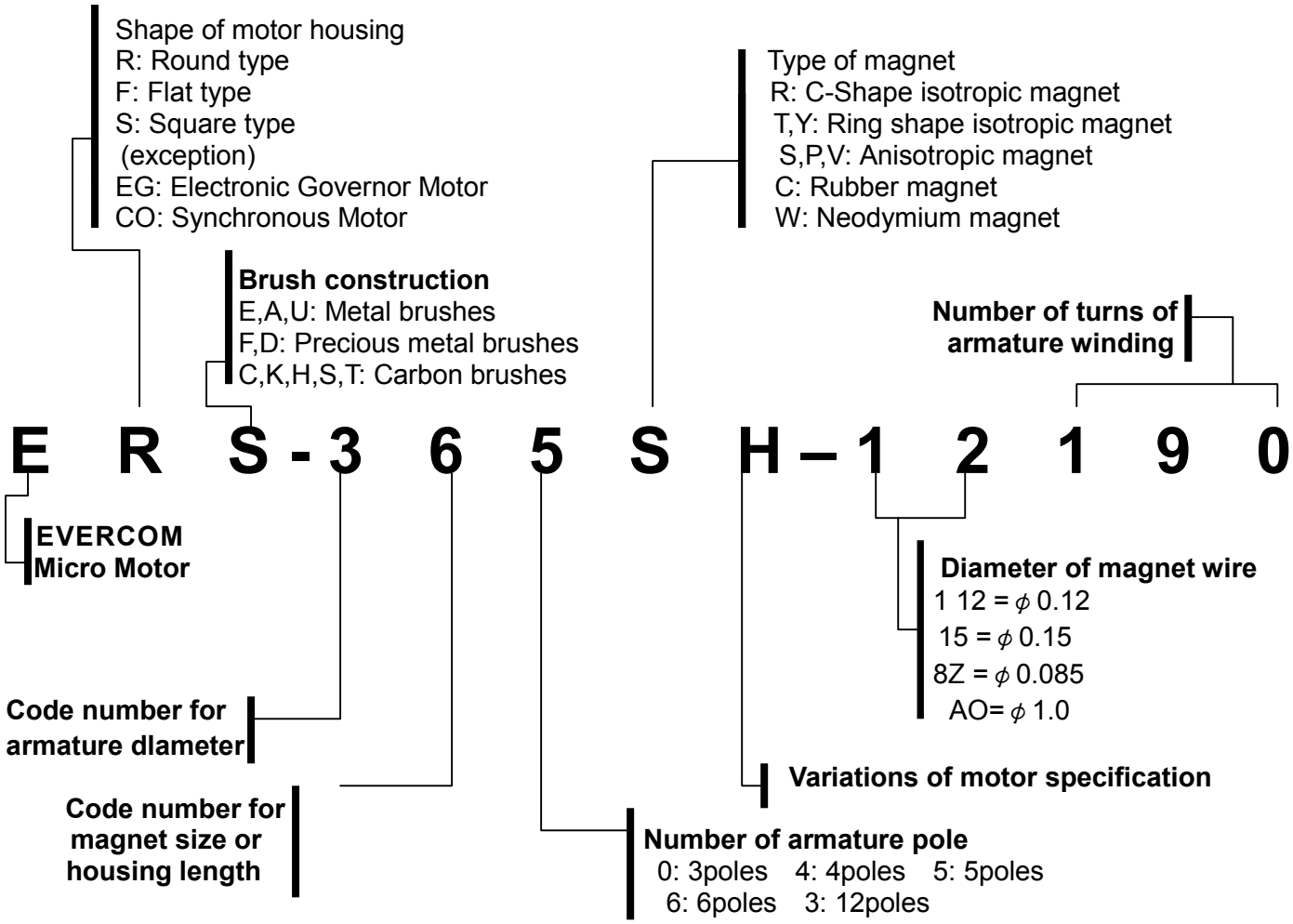
The brush for which a carbon is employed at the slide-contact portion with the commutator and fixed to a elastic brush-arm to have electrical conduction, and mainly used for our motors with high current and high output under high voltage.

General Instructions for Use of EVERCOM DC Micro Motors

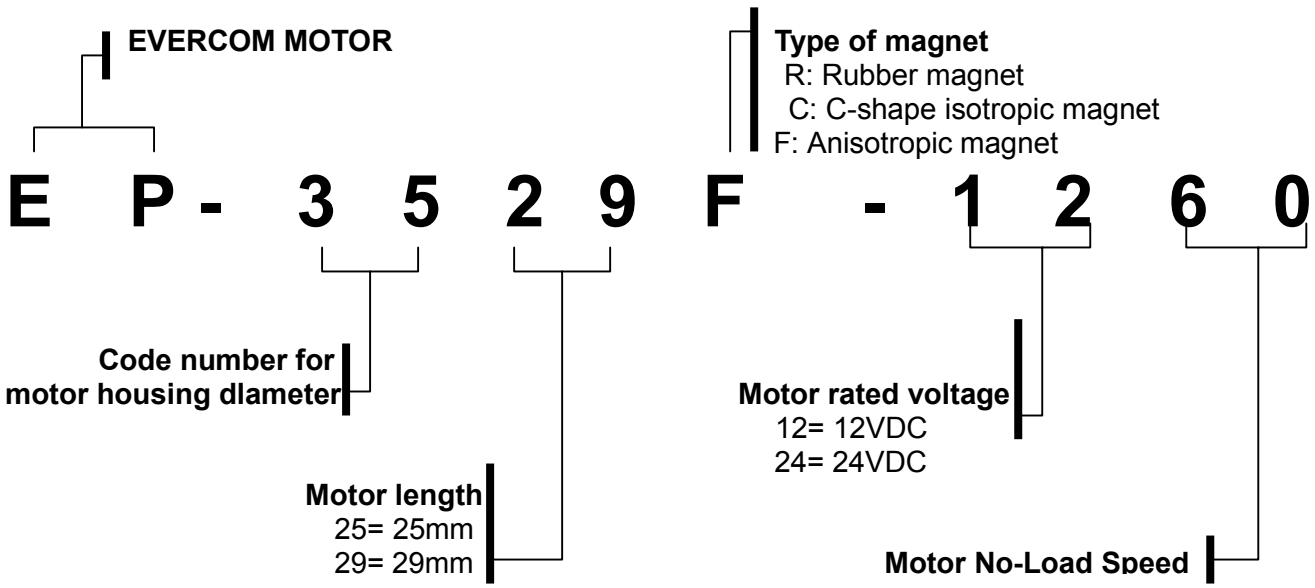
1. If silicon materials, which contain low molecular silicon compounds, adhere to the motor's commutator, brush or other parts, then upon rectification of the electric energy the silicon breaks down into SiO2, SiC and other constituents which produce a rapid increase in the contact resistance between the commutator and brush. Therefore great care should be taken when silicon material is used in a unit and check well at the same time that such binding agents or sealing materials are not generating gases of detrimental nature, whether used for motor mounting or applied during your product assembles. Care must be taken for an optimum selection, especially when using those of cyanicadhesive and sulfur gas.
2. When mounting your motors by means of binding agents, DON'T allow any adherence to the bearings nor intrusion into the motors.
3. Axial thrust on the output shaft could have an adverse effect on the motor life. i. e. As is produced by worm gears, fans, etc., Check the service life expected under the actual operating conditions by testing the motors installed in your application products. For heavy thrust loads, consider using something mechanical to retain the shaft end.
4. There are occasions when the internal resistance of the motor driving power source (Which contains an electrical circuit) can influence the life span of the motor. In instances where there is a low input of voltage to the motor, the internal resistance of the power source is large which may well result in an inferior motor after a short time, conversely in instances where high cyclic voltages are applied, this internal resistance is small and the motor life span is shortened. When the temperature deviates from the normal room temperature as is the case in low and high temperature situations, please note the conditions.
5. Motor life may be affected adversely by heavy radial load such as produced by rotating eccentric cams, etc., and also by vibration given from outside. DO check over such negative factors by testing the motors to the actual operating conditions in your application products.
6. If when mounting the motor and assembling the unit, equipment which emits ultrasonic waves is used there is a danger that some of the internal parts of the motor might be damaged so please take care.
7. DON'T store motors under environmental conditions of high temperature and extreme humidity. DON'T keep them also in an atmosphere where corrosive gas may be present, as it may result in malfunction.
8. Ambient and operating temperatures exert an affect more or less on motor performance and life. DO pay particular attention to the surroundings when it is hot and damp.
9. When press fitting a pulley, gear etc., onto the motor output shaft, always support the shaft at the other end or its retaining metal pad in a proper and correct way.
10. When soldering, BE SURE to finish your work quickly so as not to develop plastic deformation around the motor terminals nor to give them any forced bend or inward depression. In doing so, special care must be taken not to allow solder debris and flux to spatter into motors and precautionary measures should be taken if necessary, by covering up all the nearby holes and apertures. Any motors having snap-in terminals must also be attended carefully so as not to get flux in along the terminals, as it may cause failure in electrical conduction.
11. DON'T leave motor shaft locked while power is applied, as even a short-time lock-up may cause excess heat build up resulting in burning damage to the motor depending on its specifications.

*For more information, please contact us directly by telst@ms67.hinet.net or through our sales and representative offices overseas..

DC MICRO MOTOR CODING SYSTEM



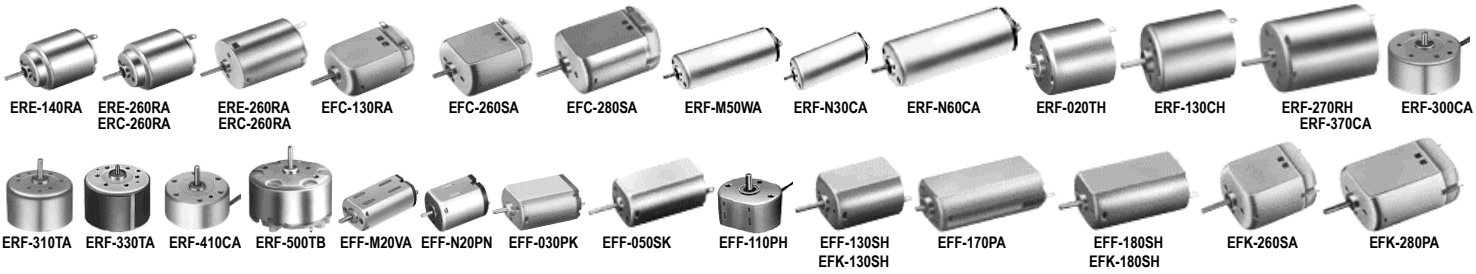
DC MICRO MOTOR FOR GEARED MOTOR CODING SYSTEM



EVERCOM®

DC MICRO MOTOR

Evercom Micro electric motors: Powerful , Reliable , Cost effective



Typical Motor Performances

MODEL	SIZE (mm)		WEIGHT	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY					STALL		
	HOUSING DIAMETER	HOUSING LENGTH		OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	TORQUE		CURRENT
			g			rpm	A	rpm	A	g · cm	mN · m	W	g · cm	mN · m	A
EFA-130RA-2270	15.1×φ20.1	25.0	17	1.5～3.0	1.5V	9100	0.20	7000	0.66	6.0	0.59	0.43	26	2.55	2.20
EFA-260RA-2670	18.3×φ24.2	26.9	28	1.5～3.0	3V	12100	0.21	10000	1.00	15	1.47	1.54	92	9.02	4.80
EFA-280RA-2865	18.3×φ24.2	30.5	35	1.5～3.0	3V	10500	0.17	8800	0.89	18	1.76	1.62	114	11.2	4.68
EFF-M20VA-8Z130	8.0×φ10.0	15.0	4	2～3	3V	15200	0.045	11800	0.16	1.6	0.16	0.19	8	0.78	0.55
EFF-N20PN-13115	10.0×φ12.0	15.0	5	1.5～3.0	2.4V	15800	0.096	12200	0.33	2.8	0.27	0.35	13	1.27	1.15
EFF-N30VA-09210	10.0×φ12.0	20.0	7.5	2～5	2.5V	5200	0.019	4000	0.066	1.8	0.18	0.074	8	0.78	0.23
EFF-030PK-08250	12.0×φ15.5	18.6	11	1～6	2.5V	4100	0.028	2900	0.071	2.1	0.21	0.062	8	0.78	0.18
EFF-050SK-11170	12.0×φ15.5	26.9	18	1.5～9.0	7V	10300	0.046	8500	0.17	7.0	0.69	0.31	46	4.51	0.82
EFF-110PH-08280	13.0×φ16.0	11.4	7.5	1～3	3V	8000	0.031	5800	0.085	1.6	0.16	0.095	6	0.59	0.23
EFF-130SH-11340	15.4×φ20.4	25.1	24	3～12	9V	7300	0.035	5900	0.15	12	1.18	0.73	67	6.57	0.68
EFF-170PA-3724	14.5×φ18.7	32.1	33	1.0～1.5	1.2V	7800	0.33	6500	1.62	18	1.76	1.20	110	10.8	8.00
EFF-180SH-2657	15.4.×φ20.4	32.1	32	1～3	2.4V	7700	0.13	6400	0.70	15	1.47	0.98	107	10.5	3.80
EFF-270PA-4031	17.9×φ21.2	30.0	34	1.2～2.0	1.2V	7000	0.70	5800	1.60	20	1.96	1.19	115	11.3	8.00
EFC-130RA-14150	15.1×φ20.1	25.0	17	4.5～6.0	4.5V	13200	0.14	9900	0.42	7.5	0.74	0.76	30	2.94	1.25
EFC-260SA-2670	18.3×φ24.2	26.9	28	3～6	4.5V	14000	0.27	11600	1.33	29	284	3.45	180	17.6	6.70
EFC-280PT-20150	18.3×φ24.2	30.5	35	9～15	12V	12500	0.12	10500	0.67	40	3.92	4.31	270	26.5	3.70
EFC-280SA-18165	18.3×φ24.2	30.5	35	10～15	12V	12400	0.10	10700	0.51	35	3.43	3.84	260	25.5	3.40
EFK-130RD-09490	15.4×φ20.4	25.0	24	9～15	12V	8800	0.030	6800	0.11	8.0	0.78	0.56	38	3.72	0.38
EFK-130RH-09490	15.4×φ20.4	25.1	24	6～18	12V	9000	0.034	6900	0.12	8.5	0.83	0.60	40	3.92	0.41
EFK-180SH-09450	15.4×φ20.4	32.1	32	12～24	24V	9200	0.025	7700	0.11	20	1.96	1.58	130	12.7	0.63
EFK-260SA-09450	18.3×φ24.2	26.9	29	12～24	12V	5700	0.030	4400	0.11	15	1.47	0.68	74	7.25	0.42
EFK-280PA-20150	18.3×φ24.2	30.5	36	10～15	12V	12000	0.10	10300	0.70	45	4.41	4.75	325	31.9	3.80
ERE-140RA-2270	φ21.0	25.0	19	1.5～3.0	1.5V	8100	0.21	6100	0.66	6.5	0.64	0.41	28	2.74	2.10
ERE-260RA-2670	φ23.8	26.9	28	1.5～3.0	3V	12300	0.20	10100	0.97	15	1.47	1.55	90	8.82	4.73
ERD-280RA-2865	φ23.8	30.5	42	1.5～3.0	3V	9200	0.16	7800	0.85	20	1.93	1.60	130	12.7	4.70
ERF-M50WA-1645	φ10.1	25.0	7.9	1.2～2.4	2.4V	16700	0.075	13600	0.35	3.0	0.29	0.42	19	1.86	1.93
ERF-N30CA-11150	φ12.1	19.5	8	2～5	5V+1Ω	19900	0.075	14900	0.25	3.7	0.36	0.57	15	1.47	0.79
ERF-N60CA-1955	φ12.1	30.0	13	1～3	2.4V	12700	0.13	10100	0.51	6.0	0.59	0.62	32	3.14	2.04
ERF-020TH-10210	φ17.1	18.0	16	2～5	4.5V	12600	0.058	9500	0.18	3.9	0.38	0.38	16	1.57	0.59
ERF-130CH-12250	φ17.1	22.8	18	2.0～7.5	3.5V	4700	0.028	3700	0.11	4.9	0.48	0.19	24	2.35	0.41
ERF-3LOPA-12330	φ24.4	10.3	18	1～2	2V	3700	0.038	2700	0.11	3.1	0.30	0.086	12	1.18	0.31
ERF-300CA-14270	φ24.4	12.3	22	0.5～0.4	1.9V	3500	0.032	2700	0.12	3.8	0.37	0.11	18	1.76	0.42
ERF-300PA-11400	φ24.4	12.3	22	1～3	3V	3000	0.015	2400	0.065	4.3	0.42	0.11	23	2.25	0.28
ERF-310TA-11400	φ24.4	18.4	29	1～6	2.5V	2800	0.017	2200	0.060	3.2	0.31	0.072	15	1.47	0.22
ERF-320CH-12400	φ24.4	18.4	28	1～5	3V	2700	0.019	2300	0.060	4.0	0.39	0.094	26	2.55	0.30
ERF-330TA-11360	φ25.0	18.4	32	2～6	3.4V	3400	0.015	2700	0.066	4.3	0.42	0.12	23	2.25	0.29
ERF-270RH-12370	φ24.4	30.8	51	6～15	12V	6200	0.028	5100	0.14	19	1.86	0.99	115	11.3	0.70
ERF-370CA-15370	φ24.4	30.8	51	3～12	12V	5600	0.025	4800	0.16	24	2.35	1.18	186	18.2	1.06
ERF-370CN-11670	φ24.4	30.8	51	6～14	12V	3200	0.013	2600	0.067	17	1.67	0.45	106	10.4	0.35
ERF-410CA-12250	φ26.4	10.0	20	1～2	1.9V	3700	0.029	2800	0.098	2.8	0.27	0.080	12	1.18	0.33
ERF-500TB-14415	φ32.0	19.5	45	1.5～9.0	6V	3700	0.028	3000	0.13	14	1.37	0.43	84	8.23	0.65
ERD-180SA-2085	φ21.3	29.0	31	1.2～4.5	2.4V	5300	0.052	4500	0.30	10	0.98	0.46	70	6.86	1.70
ERC-260RA-18130	φ23.8	26.9	28	4.5～6.0	4.5V	9800	0.14	7700	0.53	15	1.47	1.18	72	7.06	2.00
ERC-280RA-2865	φ23.8	30.5	42	4.5～6.0	4.5V	13600	0.27	11500	1.15	25	2.45	2.95	180	17.6	6.90
ERK-270RH-2680	φ24.4	30.8	51	3～6	4.5V	10200	0.12	8700	0.90	30	2.94	2.68	185	18.1	5.30
ERK-370CA-18220	φ24.4	30.8	51	6～15	9V	7000	0.060	6000	0.32	28	2.74	1.72	195	19.1	1.94
ERK-384CA-16170	φ24.4	36.0	56	24～30	30V	21000	0.15	16700	0.58	58	5.68	9.93	290	28.4	2.28
ERK-P36CB-22210	φ60.7	25.4	260	9～14	14V	2600	0.16	2100	0.58	200	19.6	4.31	1200	118	2.70
ERS-360SH-2885	φ27.7	32.6	55	3～9	7.2V	12500	0.36	11000	1.30	50	4.90	5.64	420	41.2	8.60
ERS-365SA-1885	φ27.7	32.6	49	6～20	20V	23200	0.24	18900	1.05	65	6.37	12.6	380	37.2	4.80
ERS-365SH-2080	φ27.7	32.6	54	6～20	12V	12800	0.19	1400	0.83	55	5.93	5.87	305	29.9	3.60

ERS-360SH
ERS-365SH

ERS-385SH

ERS-540SH
ERS-545SH

ERS-550SH

ERS-750SF

ERS-775SF

ERS-775VF

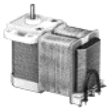
ERS-360SH

EEG-520ED

EEG-530AD
EEG-530KD

EFK-290PY
(Applicable for high voltage)

ERT-553PF
(Applicable for high voltage)



ECO-261PA
(SYNCHRONOUS MOTOR)

EJC / ELC-578

Typical Motor Performances

MODEL	SIZE (mm)		WEIGHT	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY				STALL		
	HOUSING DIAMETER	HOUSING LENGTH		OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE	OUTPUT	TORQUE		CURRENT
			g			rpm	A	rpm	A	g · cm	mN · m	W	g · cm	mN · m	A
ERS-380SH-4045	ϕ27.7	37.8	71	3～9	7.2V	16200	0.50	14000	3.29	110	10.8	15.8	840	82.3	21.6
ERS-385SA-2073	ϕ27.7	37.8	62	9～24	20V	18300	0.21	15800	0.90	75	7.35	12.2	550	53.9	5.40
ERS-285SH-2270	ϕ27.7	37.8	70	6～24	20V	16400	0.18	1400	1.04	95	9.31	13.6	670	65.7	6.20
ERS-540SH-5045	ϕ35.8	50.0	160	4.5～12	6V	8400	0.62	7200	3.91	220	21.6	16.2	1600	157	24.6
ERS-545SH-5018	ϕ35.8	50.0	156	4.5～12	12V	24000	1.30	20600	7.50	300	29.4	63.4	2180	214	45.0
ERS-550SH-7522	ϕ35.8	57.0	215	3.6～9.6	7.2V	15800	1.80	13500	10.9	410	40.0	66.4	2900	284	66.5
ERS-555SH-2670	ϕ35.8	57.0	209	9.6～30	24V	9100	0.21	7800	1.27	280	27.4	22.4	2000	196	7.70
ERS-750SF-8027	ϕ42.2	60.0	270	6～12	9.6V	18600	1.95	15900	11.8	520	51.0	84.8	3650	358	71.0
ERS-775SF-7513	ϕ42.2	67.0	320	6～15	12V	18700	2.20	16000	13.6	710	69.6	117	5100	500	84.0
ERS-775VF-909	ϕ42.2	67.0	350	6～12	12V	22600	4.50	18900	23.0	1000	98.0	194	6750	662	122
ERS-865WE-A012	ϕ42.1	67.0	370	6.0～13.5	12V	17000	3.50	15000	18.0	1000	98.0	154	9300	911	135
ESU-020SA-1665	9.5 ×18.0	18.9	9.5	1.2～1.5	1.5V	11700	0.17	8800	0.50	3.0	0.29	0.27	13	1.27	1.55
ESH-030SA-08240	9.5 ×18.0	18.9	11	6～12	12V	22300	0.080	16700	0.24	7.0	0.69	1.20	29	2.84	0.72
EFK-290PY-051000	17.9 × ϕ 21.2	42.5	50	100～120	100V	6700	0.005	5600	0.018	28	2.74	1.61	105	10.3	0.09
ERT-553PF-11100	ϕ35.7	57.0	190	100～120	120V	13000	0.080	10800	0.36	250	24.5	27.7	1750	172	2.00

Electronic Governor Motors

MODEL	SIZE (m/m)		WEIGHT	RATED VOLTAGE	WORKING VOLTAGE	RATED LOAD		RATED SPEED	RATEDLOAD CURRENT	LOAD FLUCUATION (TYPE)	STARTING TORQUE (MIN)	
	HOUSING DIAMETER	HOUSING LENGTH				g · cm	mN · m				g · cm	mN · m
			g					rpm	mA (TYPE)	rpm/g · cm		
EEG-520ED(3B)	ϕ30.0	24.0	50	13.2	8.4～16	10	0.98	2400 ±2%	74	2.5	60at8.4V	5.88at8.4 V
EEG-530AD-6F(6B)	ϕ35.0	25.0	70	6	4.2～7.5	8.0	0.78	2400 ±2%	132	9.0	38at4.2V	3.72at4.2 V
EEG-530AD-9F(9B)			70	9	6～11	8.0	0.78	2400 ±2%	92	9.0	50at 6.0V	4.90at6.0 V
EEG-530AD-2F(2B)			70	12	8.4～15	8.0	0.78	2400 ±2%	73	9.0	60at8.4V	5.88at8.4 V
EEG-530KD-9F(9B)	ϕ35.0	25.0	70	9	6.3～11.7	10	0.98	1600 3200	109 116	5.0 7.0	40	3.92
EEG-530KD-2F(2B)			70	12	8.4～15.6	10	0.98	1600 3200	83 89	5.0 7.0	50	4.90
EEG-530YD-9BH	ϕ35.0	25.0	70	9	6.3～11.7	10	0.98	2000 4000	128 140	1.5 4.0	50	4.90
EEG-530YD-2BH			70	12	8.4～15.6	10	0.98	2000 4000	99 108	1.5 4.0	55	5.39

Synchronous Motors

MODEL	SIZE	VOLTAGE		FREQUENCY	SPEED	CURRENT	INPUT	PULL OUT TORQUE	
		OPERATING RANGE	NOMINAL						
	(m/m)	AC · V	AC · V	Hz	rpm	A	W	g · cm	mN · m
ECO-241PA-112700	27.2 ×44.5 × 32.8	220～240	230	50	3000	0.10	10.0	330	32.3
ECO-261PA-122100	27.2 ×44.5 × 39.2	220～240	230	50	3000	0.14	11.5	380	37.2

Power window-Lift Motors

MODEL	SIZE (m/m)		WEIGHT	VOLTAGE	NO LOAD		RATED LOAD (*)		STALL		
	HOUSING DIAMETER	HOUSING LENGTH		NOMINAL	SPEED	CURRENT	SPEED	CURENT	CURRENT	TORQUE	
					rpm	A	rpm	A	A	Kg · cm	mN · m
EJC/LC-578VA-4720	30.3 ×39.0	72.0	520	12V	92	1.30	58	6.40	24.0	93	9.12
EJD/LD-578VA-4720			515								

(*)PATED LOAD = 30Kg.cm (2.94N.m)

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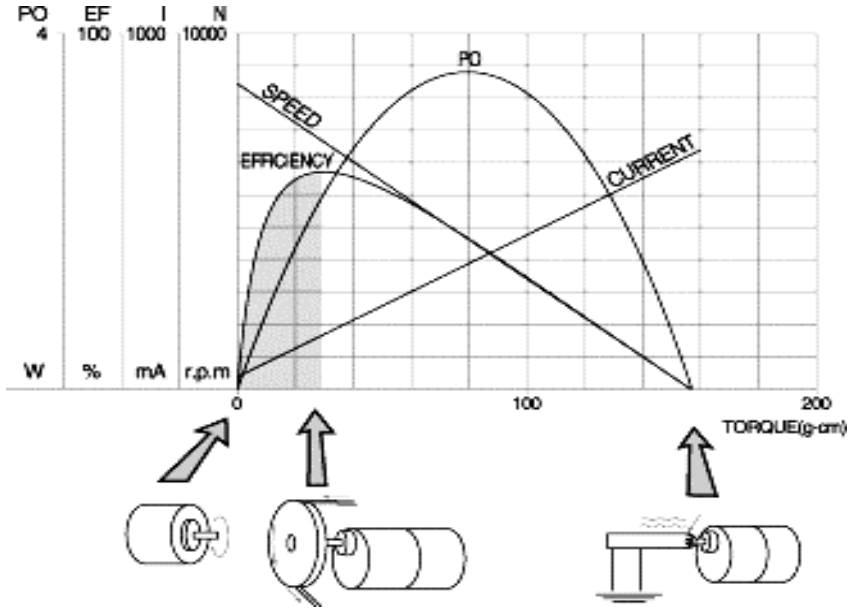
DC MICRO GEARED MOTORS

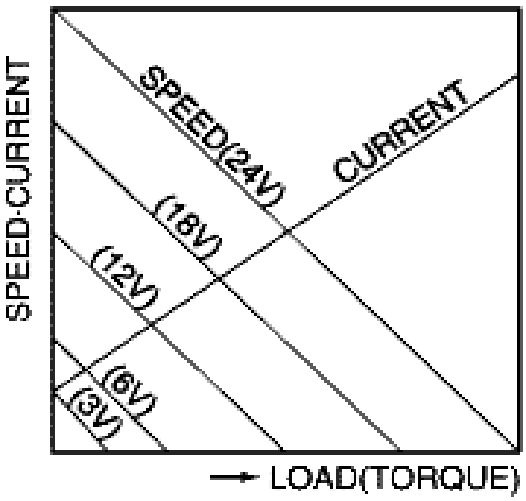
SPEED AND LOAD CHARACTERISTICS



The relationship between torque vs speed and current is linear as showed left ;as the load on a motor in creases,Speed will decrease. The graph pictured here represents the characteristics of a typical motor.
As long as the motor is used in the area of high efficiency (as represented by the shaded area) long life and good performance can be expected. However, using the motor outside this range will result in high temperature rises and deterioration of motor parts.

If voltage in continuous applied to a motor in a locked rotor condition, the motor will heat up and fail in a relatively short time. Therefore it is important that there is some form of protection against high temperature rises.
A motor's basic rating point is slightly lower than its maximum efficiency point.
Load torque can be determined by measuring the current drawn when the motor is attached to a machine whose actual load value is known.
We will select the most suitable motor for your application after receiving your information

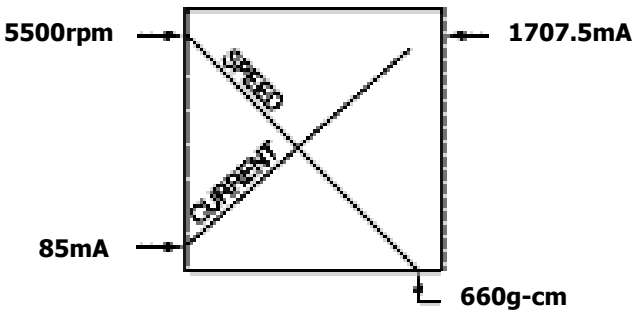
AS APPLIED VOLTAGE WILL BE CHANGED



As shown left, if the applied voltage is changed, no load peed and starting torque also change in proportion to the voltage.
Speed characteristics at a given voltage are parallel to those at other voltages.
Thus, a DC motor can be used at a voltage lower than the rated voltage. But, below 1000 rpm, the speed becomes unstable, and the motor will not run smoothly

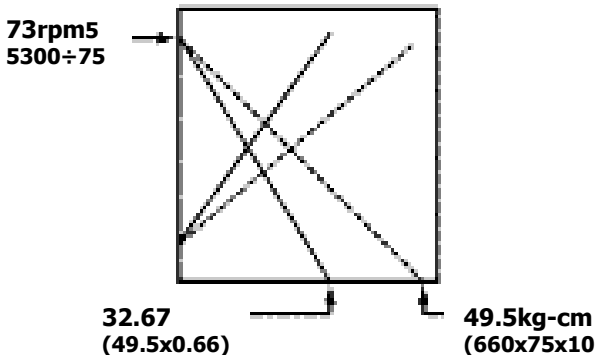
CHARACTERISTICS AND RATED PERFORMANCE OF A GEARED MOTOR

A. ex. EP-3529FA series DC motor only



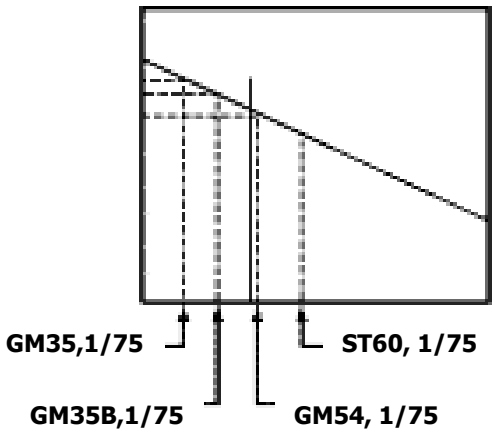
Speed reduction by means of a gear box results in increased torque.The reduction/increase is determined by the gear ratio and efficiency of the gear box

B. WITH 1/75 (4 stages) gearbox



Over-all efficiency depends on the number of reduction stages : one average is 90% per stage. Therefore: a two stage reduction gives 90 90=80%;3 stages will be 72.9% and a 4-stage reduction 66%.The above mechanical loss effects the stall torque as shown left.Stall torque of a geared motor can be calculated using the following formula: -Motor stall torque gear ratio efficiency

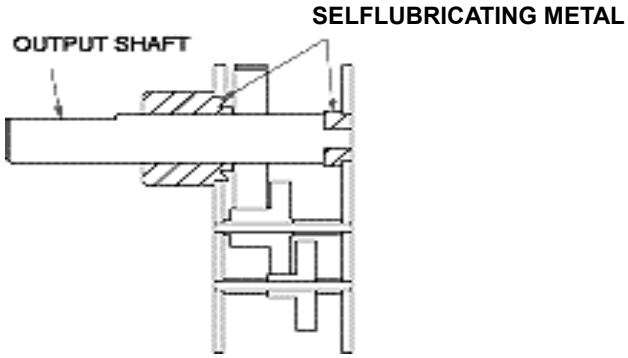
C. ALLOWABLE TORQUE



The output loading on a gear box must never exceed the manufactures "specified rated torque" as this will cause premature gear failure.
It is particularly important to observe this at slow output speeds when the calculated output torque exceeds the specified rated torque.

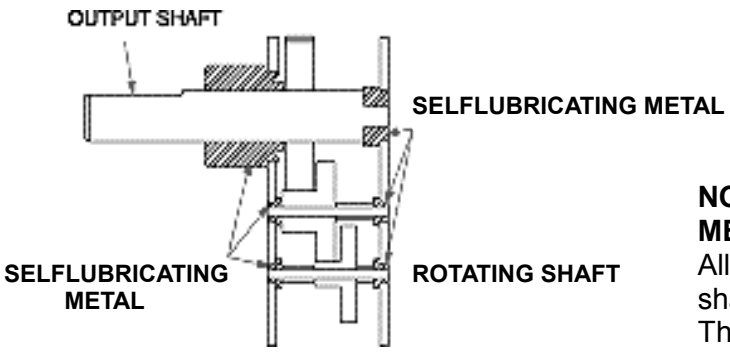
GEARBOX CONTRUCTION AND FEATURES

INTERMITTENT DUTY
(Suitable for less than 2sec.on & long enough off time)
STANDARD TYPE:**GM30,GT30,GM33GM35,GM35,GM35B,GM37,GT38,GM56,GM90**



STANDARD GEAR MECHANISM
Other than the output gear, the gears rotate around a shaft that is fixed to the plate.

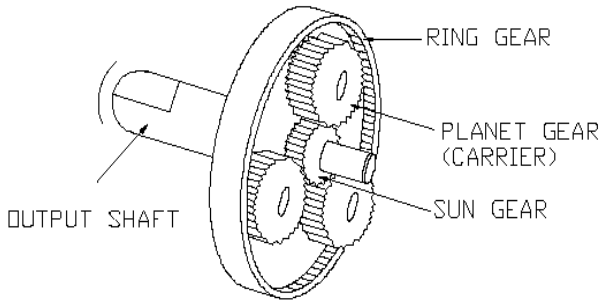
HEAVY LOAD-self lubricatingTYPE:**GM35P,GM38,GM50P,GM54,ST70**



NON-LUBRICATED METAL BEARING GEAR MECHANISM
All gears, including the output gear, are attached to the shaft and supported by non-lubricated metal bearings. This type of mech-anism is suitable for medium load applications and continuous duty cycle operation

LOW COST VERSION-Plastic or sintered metal TYPE:**GM25N,GM27,GM35N,GM37,GM90N**

COMPACT SIZE TYPE: **P16,P22,P24,P32,P39,P42,P52**



PLANETARY GEAR MECHANISM
A heavy duty type gear mechanism using 3 mating gears to transmit torque to the output shaft. This type of mechanism is suitable for limited space applications

Protection against overload and locked rotor
When the rotor is locked and voltage is applied to the motor terminals, the temperature of the motor windings will rise and eventually short-circuit.
The time until a short-circuit condition appears differs per motor type.
It is recommended that the motor is protected against such an overload by means of a fuse, current limiter or mechanical protection.

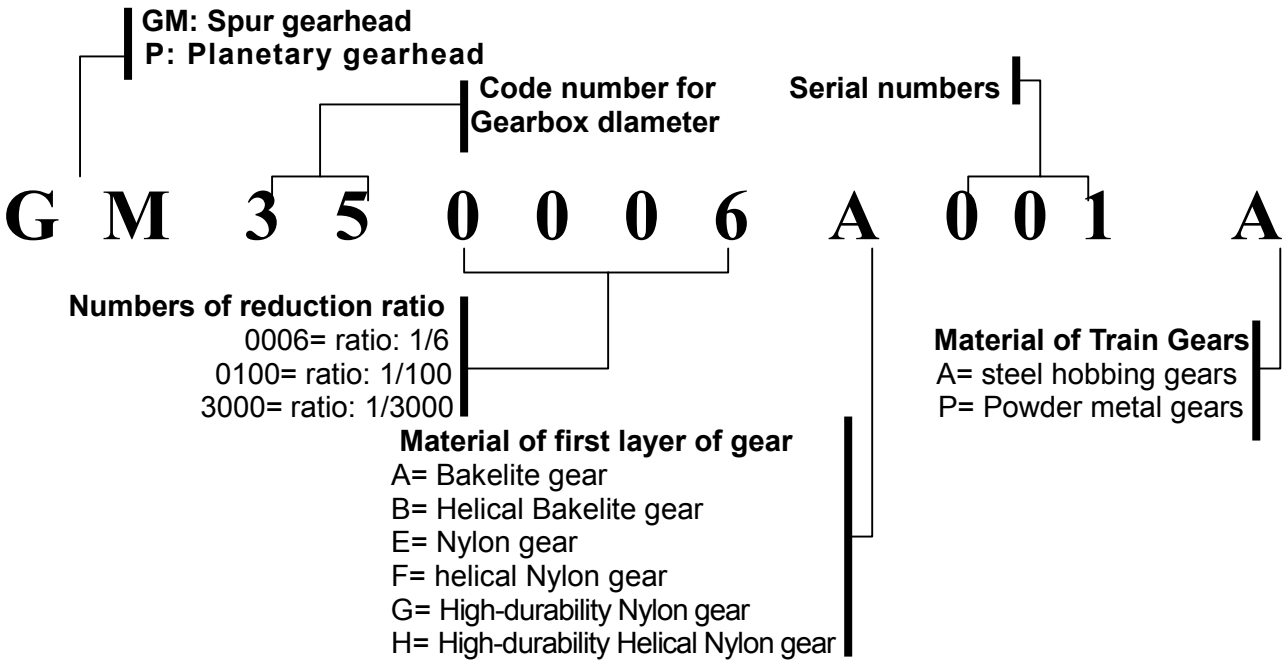
Protection against RFI/EMI caused by PWM control
An internally installed suppressor reduces electrical commutation noise caused by the brushes. Depending on the requirements, extra precautions sometimes are recommended such as an external capacitor, or filter circuit.
When driven in PWM at certain Frequencies it may occur that a motor does not start due to the combination of driving frequency and internally fitted capacitive noise suppressor.

Precautions for instantaneous reversing and dynamic braking
When the power supply to the motor is switched off, it is advisable to allow the motor to stop rotating before reversing the supply polarity. Failure to do this will result in a very high instantaneous current.
It is possible to stop the motor within a few revolutions by applying a short-circuit across the motor terminals immediately after the motor is switched off. This method is very effective but may shorten brush life.

Vertical mounting with shaft up
In some cases when a motor-gear is mounted in this position, traces of lubrication oil can contaminate the brushes and commutator thus shortening brush life or causing a short-circuit. Please contact us when vertical mounting is required.

Speed detection and control
A number of models can be provided with a magnetic or optical encoder.
Please contact us for detailed information and assistance

GEARHEAD CODING SYSTEM



EVERCOM®

DC MICRO GEARED MOTOR

SPUR GEARS

ST70 GM56 GM90 GM54 GM50 GM48P GM48 GT38 GM38 GT35

GM37 GM35B GM35 GM33 GM30 GT30 GM27 GT27 GM25 GT22 GM20 GT20 GM16 GM12F GM12

PLANETARY GEARS

P52 P43 P42 P39 P32 P24 P22S P22 P16

Typical Specifications

MODEL	SIZE				VOLTAGE		RATIO	SPEED (rpm)	Rated Torque (Kg-cm)
	TYPE	GEARHEAD	SHAFT	GEARMOTOR	RANGE	Rated			
GM12	Spur Gear	ϕ12 ×L13.9	ϕ2.0	ϕ12 ×L33.9	1.2-6V	3V	1/15 – 1/280	45 – 627	0.05-0.25
GM12F	Spur Gear	ϕ12 ×L9	ϕ3.0	ϕ12 ×L24.0	1.2-6V	4.5V	1/50 – 1/298	40 – 238	0.15-0.5
GM16	Spur Gear	ϕ16 ×L20.6	ϕ3.0	ϕ16 ×L47.5	3-12V	6V	1/10.24 –1/540	20 – 1074	0.04-0.8
GM20	Spur Gear	ϕ20 ×L24.1	ϕ3.0	ϕ20 ×L56.2	3-24V	12V	1/10 – 1/6000	0.8 – 470	0.2-1.0
GT20	Spur Gear	ϕ20 ×L20	ϕ5.0	ϕ20 ×L49	3-24V	24V	1/20 – 1/500	26 - 637	0.2-1.0
GT22	Spur Gear	ϕ22 ×L21	ϕ6.0	ϕ22 ×L40	3-24V	12V	1/10 – 1/200	38 – 754	0.1-1.5
GM25	Spur Gear	ϕ26.7 ×L18.2	ϕ4.0	ϕ26.7 ×L41.7	3-24V	6V	1/10 – 1/1000	5.6 – 560	0.1-2.0
GM27	Spur Gear	ϕ26.7 ×L19.4	ϕ4.0	ϕ26.7 ×L48.9	3-24V	12V	1/10 – 1/1000	7.4 – 740	0.1-2.0
GT27	Spur Gear	ϕ27 ×L20.3	ϕ3.0	ϕ27 ×L51.1	3-24V	24V	1/10 – 1/300	14 – 426	0.1-2.0
GM30	Spur Gear	ϕ30 ×L23	ϕ4.0	ϕ30 ×L55.6	3-24V	24V	1/10 – 1/300	17 – 500	0.15-3.5
GT30	Spur Gear	□ 30 ×L25.6	ϕ5.0	□ 30 ×L49.6	6-24V	24V	1/15 – 1/500	8.5 – 283	0.15-3.5
GM33	Spur Gear	ϕ34.9 ×L24.5	ϕ5.0	ϕ34.9 ×L53.5	6-24V	12V	1/10 – 1/3000	2 – 600	0.4-6.0
GM35	Spur Gear	ϕ37 ×L24.5	ϕ6.0	ϕ37 ×L54	6-24V	12V	1/10 – 1/3000	2 – 600	0.5-6.0
GM35B	Spur Gear	□ 43 ×L25.8	ϕ6.0	□ 43 ×L55.3	6-24V	12V	1/15 –1/494.55	12 – 400	0.5-6.0
GM37	Spur Gear	ϕ37 ×L19.3	ϕ6.0	ϕ37 ×L48.8	6-24V	12V	1/10 – 1/3000	2 – 600	0.5-6.0
GT35	Spur Gear	ϕ37 ×L22.7	ϕ5.0	ϕ37 ×L51.7	6-24V	12V	1/9.9 – 1/2900	2.06 – 606	0.5-6.0
GM38	Spur Gear	□ 42 ×L26	ϕ5.0	□ 42 ×L86	110/220VAC	100V	1/3 – 1/150	10 – 500	2.0-10
GM38	Spur Gear	□ 42 ×L28.7	ϕ5.0	□ 42 ×L68.7	6-24V	24V	1/10 – 1/3000	2 – 600	2.0-10
GT38	Spur Gear	□ 38 ×L25.7	ϕ6.0	□ 38 ×L55.2	6-24V	12V	1/10 – 1/900	6.7 – 600	0.5-7.0
GM48	Spur Gear	ϕ48 ×L16	ϕ7.0	ϕ48 ×L44	110/220VAC	220V	1/10 – 1/100	1 – 60	7.0-10.0
GM48P	Spur Gear	ϕ62 ×65 ×L16	ϕ6.0	ϕ62.31 ×L39.7	6-24V	24V	1/10 – 1/3000	1.0 – 300	0.1-1.5
GM50	Spur Gear	ϕ50 ×L34.5	ϕ6.35	ϕ50 ×L92.5	12-24V	24V	1/12.67–1/152	28 – 332	1.5-10.0
GM54	Spur Gear	□ 60 ×L38.9	ϕ8.0	□ 60 ×L98.9	12-100V DC	12V	1/20 – 1/160	33 – 265	4.5-20.0
GM56	Spur Gear	□ 56 ×L100	ϕ8.0	□ 56 ×L60.5	12-24V	12/24V	1/20 – 1/300	2 – 300	5.0-20.0
ST70	Spur Gear	□ 70 ×L100	ϕ12	□ 70 ×L93	12-100V DC	24V	1/60 – 1/800	3.4 – 92.3	2.5-10.0
GM90	Spur Gear	□ 40 ×L90	ϕ8.0	□ 40 ×L49.5	12-24V	24V	1/36 – 1/500	10 – 138	5.0-20.0
P16	Planetary	ϕ16 ×L26	ϕ3.0	ϕ16 ×L46	3-24V	12V	1/4–1/2000	3 – 1500	1.0-3.0
P22	Planetary	ϕ22 ×L25.5	ϕ3.0	ϕ22 ×L54.5	3-24V	12V	1/4.5–1/483.66	11 – 1133	0.1-1.5
P22S	Planetary	ϕ22 ×L26	ϕ4.0	ϕ22 ×L60	3-24V	12V	1/4–1/2000	3 – 1500	3.0-9.0
P24	Planetary	ϕ23.7 ×L43.6	ϕ5.0	ϕ23.7 ×L72.6	3-24V	12V	1/4.5–1/242.79	24.0 – 1287	0.1-2.0
P32	Planetary	ϕ32 ×L36	ϕ6.0	ϕ32 ×L62	3-24V	12V	1/5–1/720	7 – 1000	6.0-36.0
P39	Planetary	ϕ39 ×L29	ϕ6.0	ϕ39 ×L46.5	12-24V	12/24V	1/10 – 1/300	163 – 570	0.5-6.0
P42	Planetary	ϕ42 ×L60	ϕ8.0	ϕ42 ×L128	6-24V	12V	1/4– 1/3600	1.0– 1250	15.0-90.0
P43	Planetary	□43 ×L32.7	ϕ8.0	□43 ×L82.7	6-24V	12V	1/14 – 1/864	5.6 – 346	1.0-20.0
P52	Planetary	ϕ52 ×L58.45	ϕ12	ϕ52 ×L120.95	12-100V DC	24V	1/10 – 1/180	16 – 250	5.0-30.0

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EVERCOM®

SQUARE&SLIM SIZE GEARED MOTOR


ST76-A


ST76-B


ST76-C


ST60


ST76-D


ST73

AC SHADE POLE GEARED MOTOR Typical Specifications

MODEL	SIZE (mm)				VOLTAGE	RATIO	SPEED (rpm)	Rated Torque (Kg-cm)
	TYPE	GEARHEAD	SHAFT	GEARMOTOR	Rated			
ST60	Spur Gear	□60 ×97 X L 20	ϕ 8.0	□60 ×69 ×L 83	AC110/220V,60Hz	1/10 –1/ 850	4 - 342	5.0 – 30.0
ST73	Spur Gear	□73 ×95 X L 20	ϕ 10.0	□73 ×95 ×L 105	AC110/220V,60Hz	1/30-1/ 300	12 - 123	10.0 – 90.0
ST76-A	Spur Gear	□76 ×60 X L 15	ϕ 8.0	□76 ×60 ×L 60	AC110/220V,60Hz	1/50-1/ 560	6 - 68	1.0 – 6.0
ST76-B	Spur Gear	□76 ×64 X L 20	ϕ 8.0	□76 ×64 ×L 80	AC110/220V,60Hz	1/14 –1/ 580	6 - 248	2.0 – 20.0
ST76-C	Spur Gear	□76 ×69 X L 20	ϕ 8.0	□76 ×69 ×L 80	AC110/220V,60Hz	1/10-1/ 500	6 - 342	5.0 – 30.0
ST76-D	Spur Gear	□76 ×136 X L 26	ϕ 10.0	□76 ×136 X L 26	AC110/220V,60Hz	1/165-1/ 1100	3 - 20	20.0 – 50.0

PMDC GEARED MOTOR Typical Specifications

MODEL	SIZE (mm)				VOLTAGE		RATIO	SPEED (rpm)	Rated Torque (Kg-cm)
	TYPE	GEARHEAD	SHAFT	GEARMOTOR	Range	Rated			
ST60	Spur Gear	□60 ×97 X L 20	ϕ 8.0	□60 ×69 ×L 78	12- 48V	24VDC	1/10 –1/ 850	6 - 500	5.0 – 30.0
ST70	Spur Gear	□70 ×26 xL100	ϕ 12	□ 70 ×26 xL93	12-100V	24VDC	1/60 – 1/800	3.4 – 92.3	5.0 – 30.0
ST73	Spur Gear	□73 ×95 X L 20	ϕ 10.0	□73 ×95 ×L 90	12- 48V	24VDC	1/30-1/ 300	17 - 166	10.0 – 90.0
ST76-A	Spur Gear	□76 ×60 X L 15	ϕ 8.0	□76 ×60 ×L 60	12- 48V	24VDC	1/50-1/ 560	9 - 100	1.0 – 6.0
ST76-B	Spur Gear	□76 ×64 X L 20	ϕ 8.0	□76 ×64 ×L 80	12- 48V	24VDC	1/14 –1/ 580	9 - 360	2.0 – 20.0
ST76-C	Spur Gear	□76 ×69 X L 20	ϕ 8.0	□76 ×69 ×L 80	12- 48V	24VDC	1/30-1/ 300	17 - 167	5.0 – 30.0
ST76-D	Spur Gear	□76 ×136 X L 26	ϕ 10.0	□76 ×136 X L 26	12- 48V	24VDC	1/165-1/ 1100	4.5 - 30	20.0 – 50.0

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EVERCOM®

HIGH DURIBILITY PMDC MICRO MOTOR

FEATURE :

- Compact Size (ϕ 22~50 mm)
- High Moto-Technology Design.
- LOW-COG brush-commutated motors provide high performance at an excellent value
- Servo Motor feature with 7 or 11 slot armature with 4 standard windings for each item.
- Skewed armatures that reduce cogging and resinimpregnated windings for greater reliability.
- All the specification In accord with JIS & CE standard.

FOR OEM ORDERS ONLY !!

- **NOTICE : EVERCOM High Duribilty PMDC Micro Motor is only for customer's OEM/ODM orders, so pls contact with our sales engineer by telst@ms67.hinet.net before your samples order released !! Thank you very much !**

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