Standard AC Motors

Torque Motors

Torque Motors

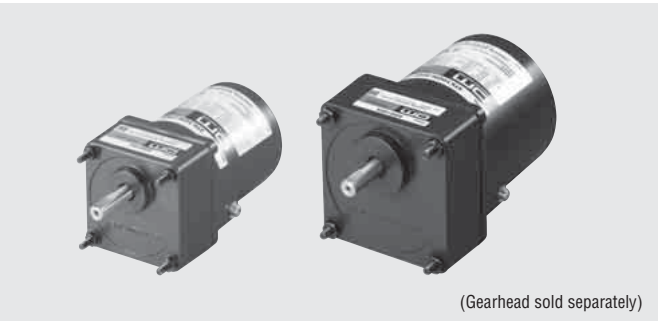
RoHS RoHS-Compliant

Torque Motors

●Additional Information●
Technical reference ➜ Page F-1
Safety standards ➜ Page G-2

Torque motors are designed to provide high starting torque and sloping characteristics (torque is highest at zero speed and decreases steadily with increasing speed), and operate over a wide speed range. They also provide stable operation, especially in the low speed range or under a locked rotor condition.

●List of safety standard approved products (Model, Standards, File No., Certification Body)
➜ Page G-11

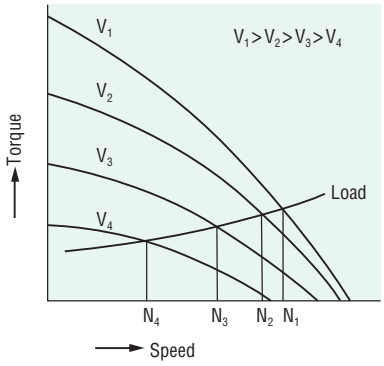


(Gearhead sold separately)

Features

●The Speed Can Vary Widely, Depending on the Sloping Characteristics

Torque motors have a high starting torque and sloping characteristics, allowing easy speed control simply by changing the voltage supplied to the motor. (The motor torque varies in proportion to the square of the voltage.)



◇Voltage Control of Torque Motors

The method most commonly used to control voltage is by phase control using a triac. As shown in Fig. 1, by changing the phase angle “alpha” at which the triac switches, the input voltage is controlled as represented by the shaded areas of the graph.

●When adjusting the speed or the torque, an external voltage adjuster is necessary.

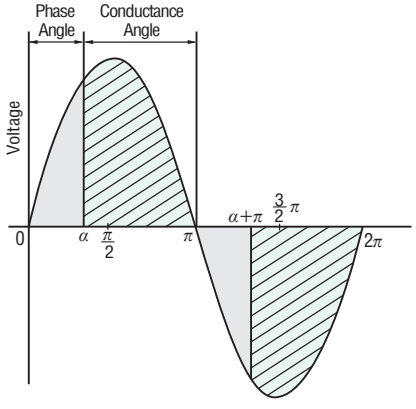
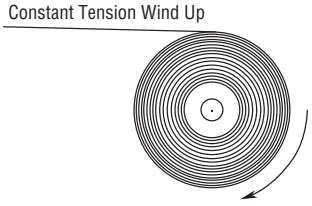


Fig. 1 Phase Control

●Suitable for Winding Applications

In an application where an object is released continuously at a constant speed and wound up with constant tension, the torque must be doubled and the speed must be halved if the diameter of the winding spool is doubled.



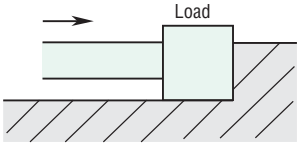
●Locked Rotor Operation is Available

Unlike induction motors or reversible motors, torque motors are designed to provide a stable torque even under locked rotor conditions or at very low speed (nearly locked rotor condition). They are suitable for pushing applications that require static torque, or for loads that are under locked rotor conditions at the end of processes.

Motors of 115 VAC input can operate continuously at 60 VAC. When used at voltages above 60 VAC, these motors have short time ratings. They have a 5 minutes rating at 115 VAC.

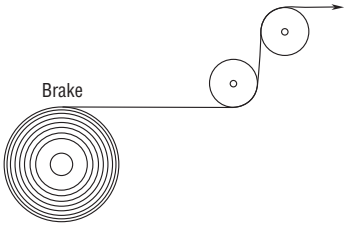
Note:

●When using a motor in a locked rotor operation, the output torque becomes very large. The output torque of the gearhead must be lower than the maximum permissible torque. Also, ensure that the load does not hit an object and stop, since this can cause damage to the gearhead due to the shock.



●Use as a Brake

By using the motor in the braking region of the speed – torque characteristics, it can serve as a brake. Constant tension control can be achieved by applying a DC excitation.



●Application as a Brake

A torque motor has the following two characteristics that allow it to be used as a brake:

Reverse-phase brake: Brake characteristics obtained when AC voltage is applied to the motor and the motor is rotated in the direction opposite to the rotational magnetic field

Eddy-current brake: Brake characteristics obtained when DC voltage is applied to the motor

Unlike a brake pack or an electromagnetic brake that stop the motor, these reverse-phase brake and eddy-current brake characteristics are suited for winding mechanisms and other applications where tension (back-tension) control is required.

◇Application as a Reverse-Phase Brake

When a torque motor is used as a reverse-phase brake, connect the motor according to the connection diagram and apply AC voltage. (➜ Page A-237)

The motor operates at a speed balanced with the load according to the speed – torque characteristics (➜ Page A-233), when the motor is not receiving any force that turns it in the direction opposite to the rotational magnetic field.

To use a torque motor as a brake, force the motor to rotate in the direction opposite to the rotational magnetic field at a torque greater than the starting torque of the motor. Then, the torque motor rotates in the direction opposite to the rotational magnetic field while generating a certain brake force.

Fig. 2 shows an example of speed – brake torque characteristics. When a reverse-phase brake is used, a large brake force can be obtained at the speed of 0 r/min. The reverse-phase brake is suitable for applications where tension force is required even when the motor is at standstill.

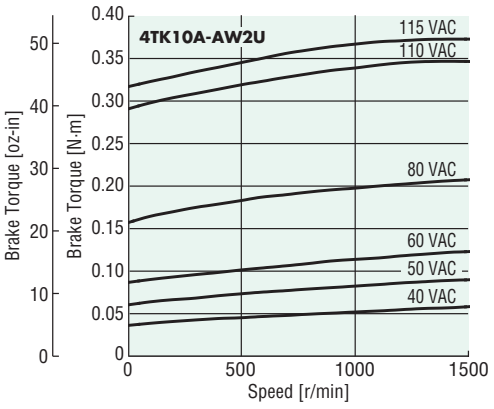
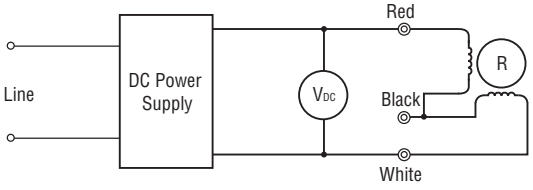


Fig. 2
Example of Speed – Brake Torque Characteristics with Reverse-Phase Brake (Reference values)

◇Application as an Eddy-Current Brake

When a torque motor is used as an eddy-current brake, connect the red and white leadwires of the torque motor in series, as shown in Fig. 3, and apply DC voltage. At this time, insulate the black leadwire so that it will not contact any other part of the circuit.

Fig. 4 shows an example of speed – brake torque characteristics. The brake torque varies depending on the applied voltage and speed. When the speed is 0 r/min, the brake torque becomes 0 N·m (0 oz-in). The brake torque increases as the speed increases, and stabilizes once the speed reaches a certain high level. A similar brake force can also be achieved whether the motor is rotating in the forward or reverse direction. An eddy-current brake is suitable for applications where tension force is required at high-speed operations or at bi-directional operations.



Note:
● The black leadwire should be insulated.

Fig. 3
Connection Diagram for Eddy-Current Brake

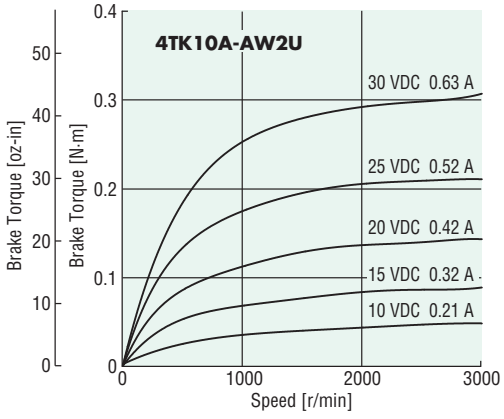


Fig. 4
Example of Speed – Brake Torque Characteristics with Eddy-Current Brake (Reference values)

Notes:
● When a torque motor is used as a brake, continuous operating time varies depending on the specific conditions.
● If a torque motor is combined with a gearhead, keep the speed to 2400 r/min or below.

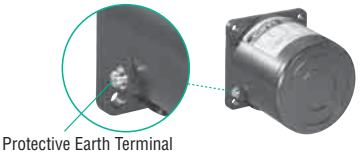
●Conforms to Major Safety Standards and Global Power Supply Voltages

Torque Motors are recognized by UL and CSA, and certified under the China Compulsory Certification System (CCC System). CE Marking is used in accordance with the Low Voltage Directive. Also, our wide range of products includes those that meet the power supply voltages of major countries in Asia, North America and Europe.

●The Motor Bearing Life is Twice as Long as a Conventional Type

A motor's life is determined by its bearing. We adopted high-performance bearing grease to lubricate this important component. As a result, the bearings of motors last twice as long as our conventional bearings.

●Protective Earth Terminal on the Motor



●RoHS RoHS-Compliant

Torque motors conform to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

● Details of RoHS Directive ➜ Page G-38

■Features and Types of Gearheads

●Long Life, Low Noise **GN-S** Gearhead is Available

Adopting innovative technologies and structure, the "long life, low noise **GN-S** gearhead" achieves a long rated life of 10000 hours, twice as long as the level of a conventional gearhead. Also, the gearhead is designed for low noise.

● Details of long life, low-noise **GN-S** gearhead ➜ Page A-21

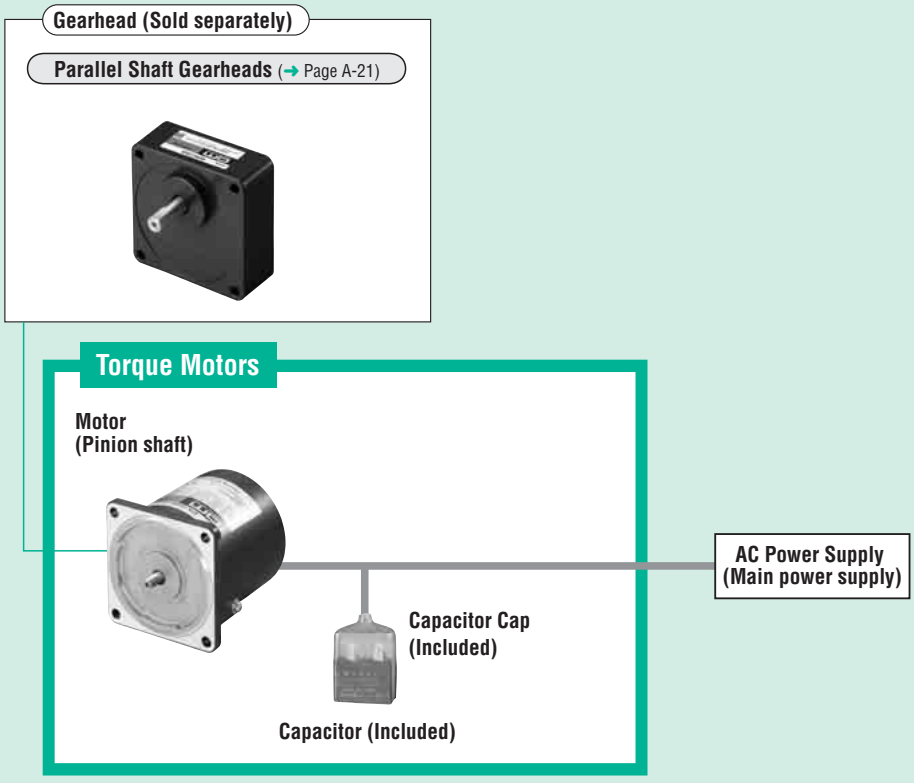
●Types of Gearheads RoHS

Gearhead			Applicable Motor		Rated Life (hours)	Low Noise
Type of Gearhead		Type of Pinion	Output Power	Type of Pinion		
Parallel Shaft	Long Life, Low Noise **GN-S** Gearhead	**GN** Type Pinion Shaft	3 W~20 W (1/250 HP~1/38 HP)	**GN** Type Pinion Shaft	10000	●
	GN-K Gearhead	**GN** Type Pinion Shaft	3 W~20 W (1/250 HP~1/38 HP)	**GN** Type Pinion Shaft	5000	

Note:

● The right-angle gearheads cannot be combined.

System Configuration



No.	Product Name	Overview	Page
①	Mounting Brackets	Dedicated mounting bracket for the motor and gearhead.	A-288
②	Flexible Couplings	Clamp type coupling that connects the motor or gearhead shaft to the driven shaft.	A-292

●Example of System Configuration

	(Sold separately)		(Sold separately)	
Torque Motor (Pinion shaft)	Long Life, Low Noise Gearhead	+	Mounting Bracket	Flexible Coupling
4TK10GN-AW2U	4GN25SA		SOL4U10	MCL30F06F06

●Gearheads cannot be combined with round shaft type motors.

● The system configuration shown above is an example. Other combinations are available.

Product Number Code

Motor

5 T K 20 GN - AW 2 U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Motor Frame Size	**2**: 60 mm (2.36 in.) **3**: 70 mm (2.76 in.) **4**: 80 mm (3.15 in.) **5**: 90 mm (3.54 in.)
②	Motor Type	**T**: Torque Motor
③	Series	**K**: **K** Series
④	Output Power (W)	(Example) **20**: 20 W (1/38 HP)
⑤	Motor Shaft Type, Type of Pinion	**A**: Round Shaft **GN**: **GN** Type Pinion Shaft
⑥	Power Supply Voltage	**AW**: Single-Phase 110/115 VAC **CW**: Single-Phase 220/230 VAC
⑦	**2**: RoHS-Compliant	
⑧	Included Capacitor	**U**: For Single-Phase 110/115 VAC **E** : For Single-Phase 220/230 VAC

● The **U** and **E** at the end of the model name indicate that the unit includes a capacitor. These letters are not listed on the motor nameplate.
When the motor is approved under various safety standards, the model name on the nameplate is the approved model name. ➜ Page G-11
(Example) Model: **5TK20GN-AW2U**
➜ Motor nameplate and product approved under various safety standards: **5TK20GN-AW2**

Gearhead

5 GN 50 SA

① ② ③ ④

①	Gearhead Frame Size	**2**: 60 mm (2.36 in.) **3**: 70 mm (2.76 in.) **4**: 80 mm (3.15 in.) **5**: 90 mm (3.54 in.)
②	Type of Pinion	**GN**: **GN** Type Pinion
③	Gear Ratio	(Example) **50**: Gear Ratio of 50:1 **10X** denotes the decimal gearhead of gear ratio 10:1
④	**SA**: Long Life, Low Noise **GN-S** Gearhead, RoHS-Compliant	

Note:
● The right-angle gearhead cannot be combined.

Product Line

Motor RoHS

Output Power	Model	
	Pinion Shaft Type	Round Shaft Type
3 W (1/250 HP)	**2TK3GN-AW2U**	**2TK3A-AW2U**
	2TK3GN-CW2E	**2TK3A-CW2E**
6 W (1/125 HP)	**3TK6GN-AW2U**	**3TK6A-AW2U**
	3TK6GN-CW2E	**3TK6A-CW2E**
10 W (1/75 HP)	**4TK10GN-AW2U**	**4TK10A-AW2U**
	4TK10GN-CW2E	**4TK10A-CW2E**
20 W (1/38 HP)	**5TK20GN-AW2U**	**5TK20A-AW2U**
	5TK20GN-CW2E	**5TK20A-CW2E**

The following items are included in each product.
Motor, Capacitor, Capacitor Cap, Operating Manual

Parallel Shaft Gearhead (Sold separately)

◇Long Life, Low Noise **GN-S** Gearhead RoHS

Applicable Motor Output Power (Pinion shaft type)	Gearhead Model	Gear Ratio
3 W (1/250 HP)	**2GN□SA**	**3**, **3.6**, **5**, **6**, **7.5**, **9**, **12.5**, **15**, **18**, **25**, **30**, **36**, **50**, **60**, **75**, **90**, **100**, **120**, **150**, **180**
	2GN10XS (Decimal gearhead)	
6 W (1/125 HP)	**3GN□SA**	**3**, **3.6**, **5**, **6**, **7.5**, **9**, **12.5**, **15**, **18**, **25**, **30**, **36**, **50**, **60**, **75**, **90**, **100**, **120**, **150**, **180**
	3GN10XS (Decimal gearhead)	
10 W (1/75 HP)	**4GN□SA**	**3**, **3.6**, **5**, **6**, **7.5**, **9**, **12.5**, **15**, **18**, **25**, **30**, **36**, **50**, **60**, **75**, **90**, **100**, **120**, **150**, **180**
	4GN10XS (Decimal gearhead)	
20 W (1/38 HP)	**5GN□SA**	**3**, **3.6**, **5**, **6**, **7.5**, **9**, **12.5**, **15**, **18**, **25**, **30**, **36**, **50**, **60**, **75**, **90**, **100**, **120**, **150**, **180**
	5GN10XS (Decimal gearhead)	

● Enter the gear ratio in the box (□) within the model name.

The following items are included in each product.
Gearhead, Mounting Screws, Operating Manual

● Following gearheads are also available. For details, please refer to website (http://www.orientalmotor.com/) or contact the nearest Oriental Motor sales office.

Gearhead Type		Gearhead Model	Gear Ratio
Parallel Shaft	RoHS **GN-K** Gearhead	**2GN□KA**	**3**~**180**
		2GN10XK (Decimal gearhead)	
		3GN□KA	**3**~**180**
		3GN10XK (Decimal gearhead)	
		4GN□KA	**3**~**180**
		4GN10XK (Decimal gearhead)	
		5GN□KA	**3**~**180**
		5GN10XK (Decimal gearhead)	

● Enter the gear ratio in the box (□) within the model name.

Specifications RoHS

Model		Rating at Locked Rotor	Voltage	Frequency	Starting Torque		Max. Output Power		Speed at Max. Output Power	Torque at Max. Output Power		Current at Max. Output Power	Input Power at Max. Output Power	Capacitor
Pinion Shaft Type	Round Shaft Type		VAC	Hz	mN·m	oz-in	W	HP	r/min	mN·m	oz-in	A	W	μF
TP 2TK3GN-AW2U	2TK3A-AW2U	5 minutes	110	60	70	9.9	3.5	1/210	900	38	5.3	0.42	45	6.0
			115									0.45	50	
		Continuous	60	60	25	3.5	1.2	1/620	900	13	1.84	0.26	15	
TP 2TK3GN-CW2E	2TK3A-CW2E	5 minutes	220	50	70	9.9	3	1/250	750	39	5.5	0.220	45	1.5
			230									0.240	50	
			220	60	70	9.9	3.5	1/210	900	38	5.3	0.215	45	
			230									0.230	50	
		Continuous	115	50	18	2.5	0.8	1/930	750	10	1.42	0.095	10	
				60	25	3.5	1.2	1/620	900	13	1.84	0.130	14	
TP 3TK6GN-AW2U	3TK6A-AW2U	5 minutes	110	60	150	21	8	1/93	900	87	12.3	0.60	65	9.0
			115									0.65	70	
		Continuous	60	60	55	7.8	2.6	1/290	900	28	3.9	0.37	20	
TP 3TK6GN-CW2E	3TK6A-CW2E	5 minutes	220	50	140	19.8	6	1/125	750	78	11.0	0.390	70	2.5
			230									0.440	80	
			220	60	150	21	8	1/93	900	87	12.3	0.320	70	
			230									0.350	75	
		Continuous	115	50	45	6.3	1.8	1/410	750	24	3.4	0.145	15	
				60	55	7.8	2.6	1/290	900	28	3.9	0.210	24	
TP 4TK10GN-AW2U	4TK10A-AW2U	5 minutes	110	60	210	29	12	1/62	900	130	18.4	0.74	80	11
			115									0.76	85	
		Continuous	60	60	70	9.9	3.3	1/230	900	35	4.9	0.45	25	
TP 4TK10GN-CW2E	4TK10A-CW2E	5 minutes	220	50	220	31	10	1/75	750	130	18.4	0.41	80	3.0
			230									0.45	90	
			220	60	210	29	12	1/62	900	130	18.4	0.39	80	
			230									0.40	80	
		Continuous	115	50	65	9.2	2.8	1/270	750	35	4.9	0.18	20	
				60	70	9.9	3.3	1/230	900	35	4.9	0.24	25	
TP 5TK20GN-AW2U	5TK20A-AW2U	5 minutes	110	60	350	49	23	1/32	900	250	35	1.00	110	14
			115									1.02	115	
		Continuous	60	60	100	14.2	5.5	1/140	900	60	8.5	0.58	34	
TP 5TK20GN-CW2E	5TK20A-CW2E	5 minutes	220	50	350	49	20	1/38	750	260	36	0.63	120	4.0
			230									0.68	130	
			220	60	350	49	20	1/38	900	220	31	0.53	115	
			230									0.54	120	
		Continuous	115	50	85	12.0	4.5	1/170	750	60	8.5	0.26	29	
				60	100	14.2	5.5	1/140	900	60	8.5	0.30	34	

TP: Contains a built-in thermal protector (automatic return type). If a motor overheats for any reason, the thermal protector is activated and the motor is stopped. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor power off before inspecting.

General Specifications

Item	Specifications
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the windings and the case after rated operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 1.5 kVAC at 50 Hz or 60 Hz applied between the windings and the case for 1 minute after rated operation under normal ambient temperature and humidity.
Temperature Rise	Temperature rise of windings is 80°C (144°F) or less measured by the resistance change method after rated operation under normal ambient temperature and humidity with connecting a gearhead or equivalent heat radiation plate*.
Insulation Class	Class B [130°C (266°F)]
Overheat Protection	Built-in thermal protector (automatic return type) 3 W (1/250 HP) type Open: 130±5°C (266±9°F), Close: 90±15°C (194±27°F) Other type Open: 130±5°C (266±9°F), Close: 82±15°C (179.6±27°F)
Ambient Temperature	−10～+40°C (+14～+104°F) (non-freezing)
Ambient Humidity	85% or less (non-condensing)
Degree of Protection	IP20

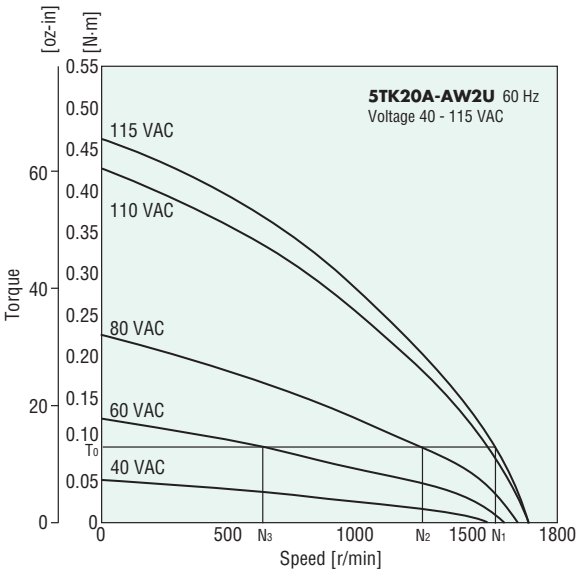
*Heat radiation plate (Material: Aluminum)

Motor Type	Size: mm (in.)	Thickness: mm (in.)
3 W (1/250 HP) Type	115×115 (4.53×4.53)	5 (0.20)
6 W (1/125 HP) Type	125×125 (4.92×4.92)	
10 W (1/75 HP) Type	135×135 (5.31×5.31)	
20 W (1/38 HP) Type	165×165 (6.50×6.50)	

How to Read Speed – Torque Characteristics

The motor torque varies approximately in proportion to the square of the voltage. When the voltage supplied to the motor is changed, speed – torque characteristics curves with a sloping characteristics (torque is highest at zero speed and decreases steadily with increasing speed) shifts to that of the corresponding voltage.
When the voltage is changed to 115 VAC, 80 VAC and 60 VAC while the load torque is T_0, the motor rotates at the speeds N_1, N_2 and N_3 respectively. Thus, the speed can be changed easily by varying the voltage.

When choosing a torque motor, first determine the required torque and speed. Then, determine whether the motor should be operated under continuous duty or limited duty and check the speed – torque characteristics. When used under locked rotor conditions, only the torque factor is considered.
The temperature rise of the motor may cause a problem during continuous operation. In this case, choose a motor with an output power large enough for continuous operation and adjust the voltage to control the torque and speed.

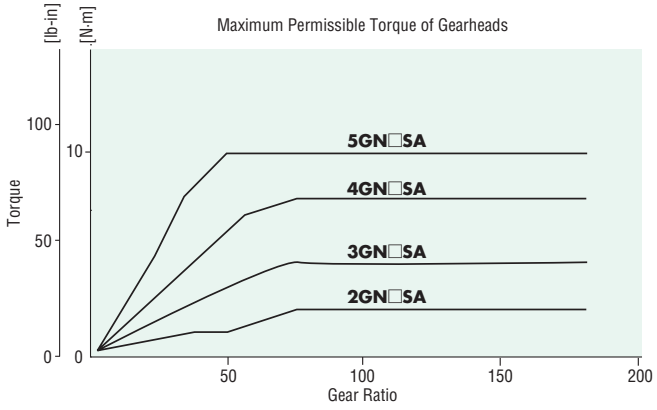


Output Torque of Gearmotor

Due to the sloping characteristics, torque motors can be operated over a wide speed range, from standstill to the maximum speed. The permissible torque when a gearhead and a decimal gearhead are connected can be calculated according to the following formula, using the speed and torque determined from the speed – torque characteristics.

Speed of gearhead output shaft N_G = Motor speed×1/gearhead gear ratio
Output torque of gearhead T_G = Motor torque×Gearhead gear ratio×Gearhead efficiency

The output torque of gearhead must be lower than the maximum permissible torque.

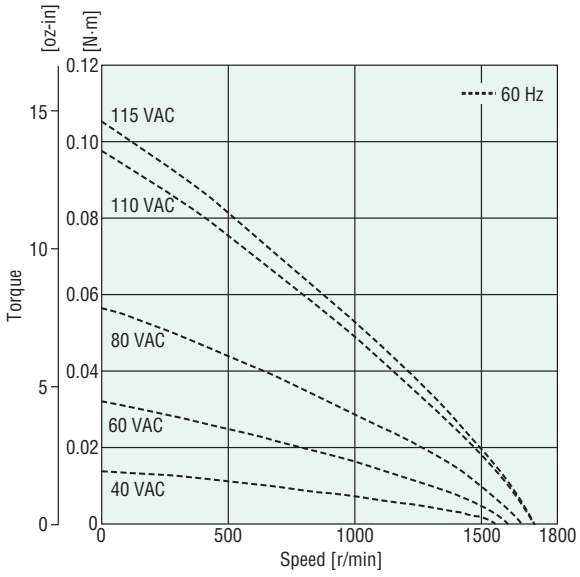


Gearhead Model	Gearhead Gear Ratio	Gearhead Efficiency
2GN□SA **3GN□SA** **4GN□SA** **5GN□SA**	**3～18**	81%
	25～36	73%
	50～180	66%

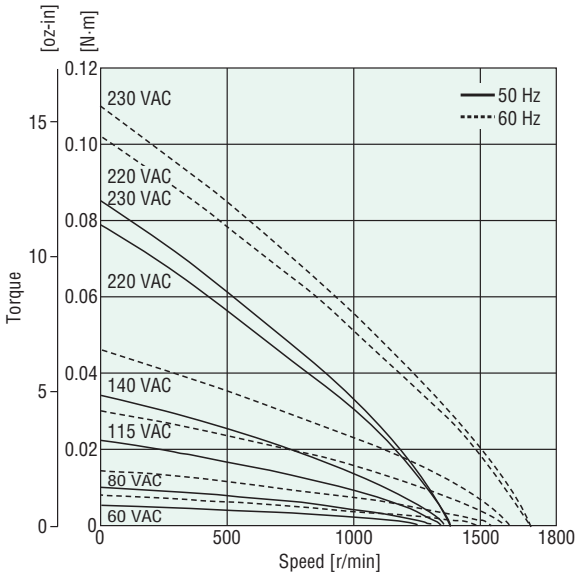
- Gearheads and decimal gearheads are sold separately.
- Enter the gear ratio in the box (□) within the model name.
- The direction of gearhead shaft rotation may differ from motor shaft rotation depending on the gear ratio of gearhead. Gear ratio and rotation direction of gearhead ➜ Page A-14

Speed – Torque Characteristics (Reference values)

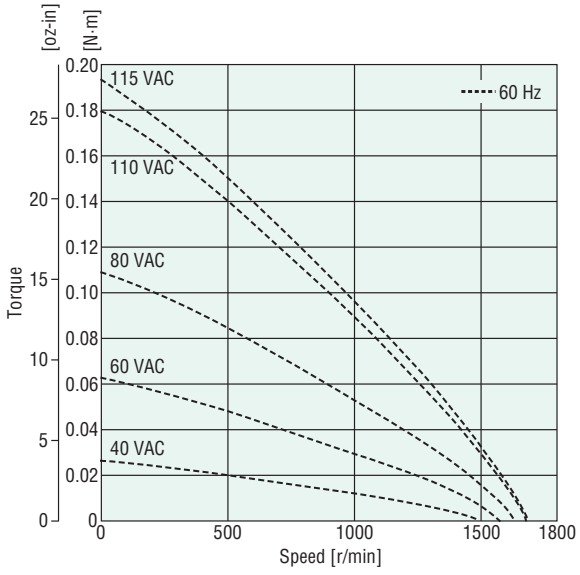
2TK3GN-AW2U, 2TK3A-AW2U



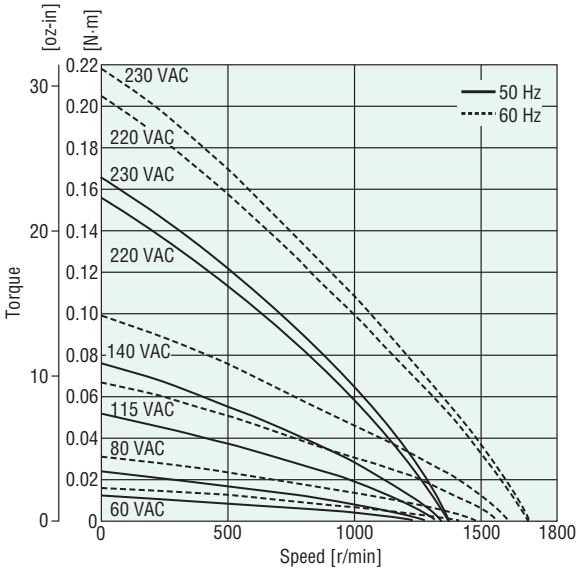
2TK3GN-CW2E, 2TK3A-CW2E



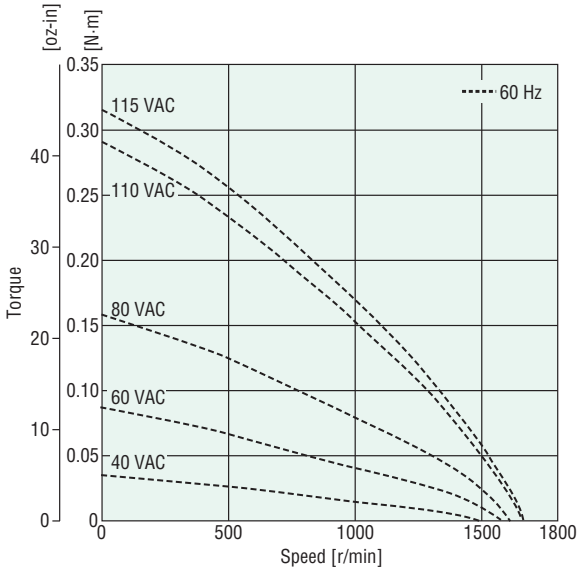
3TK6GN-AW2U, 3TK6A-AW2U



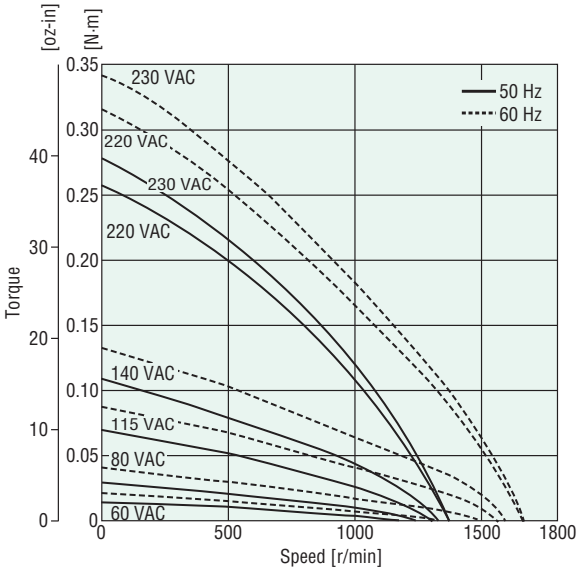
3TK6GN-CW2E, 3TK6A-CW2E



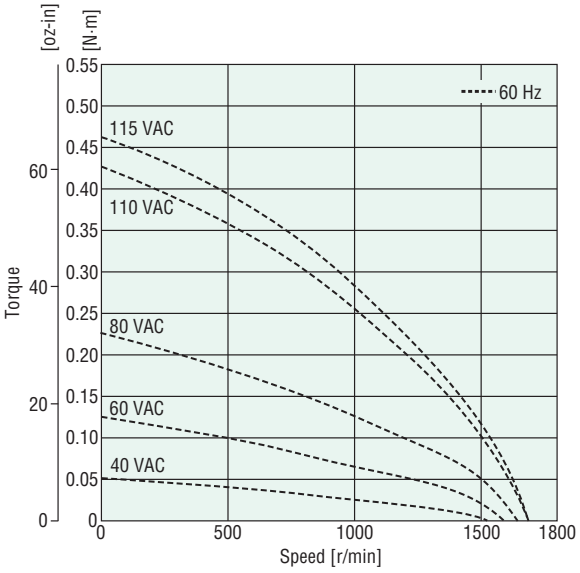
4TK10GN-AW2U, 4TK10A-AW2U



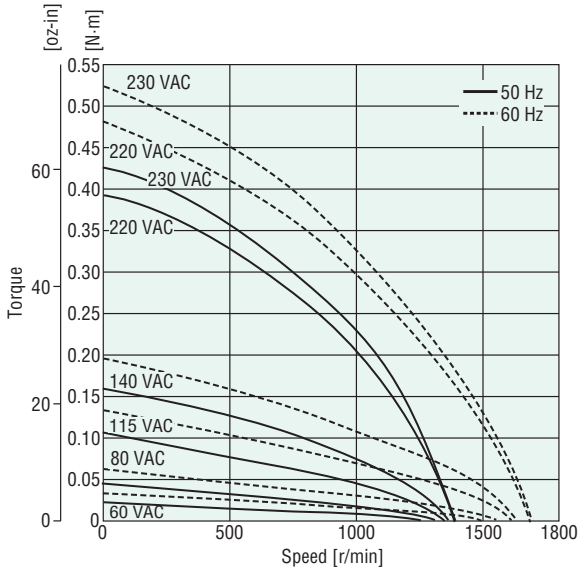
4TK10GN-CW2E, 4TK10A-CW2E



5TK20GN-AW2U, **5TK20A-AW2U**



5TK20GN-CW2E, **5TK20A-CW2E**



Dimensions Unit = mm (in.)

● Mounting screws are included with gearheads. Dimensions for mounting screws ➜ Page A-310

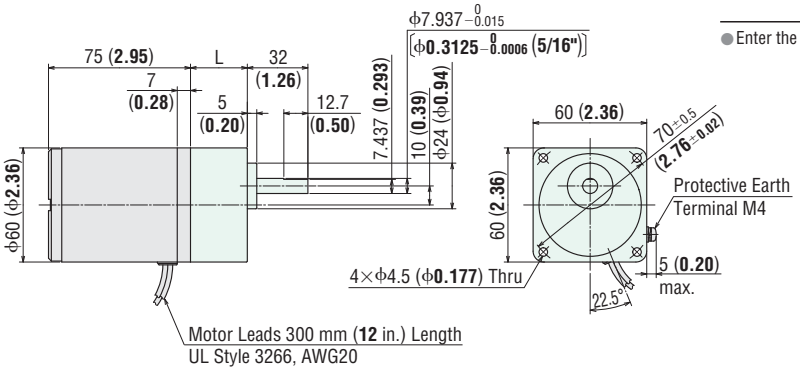
●3 W (1/250 HP)

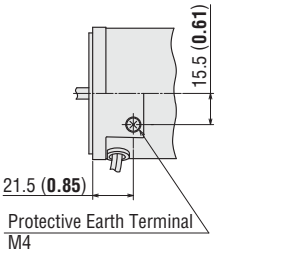
◇Motor/Gearhead

Mass: Motor 0.7 kg (1.54 lb.)
Gearhead 0.4 kg (0.88 lb.)

Motor Model	Gearhead Model	Gear Ratio	L	DXF
2TK3GN-AW2U **2TK3GN-CW2E**	**2GN□SA**	**3～18**	30 (1.18)	A443AU
		25～180	40 (1.57)	A443BU

● Enter the gear ratio in the box (□) within the model name.





Detail Drawing of Protective Earth Terminal

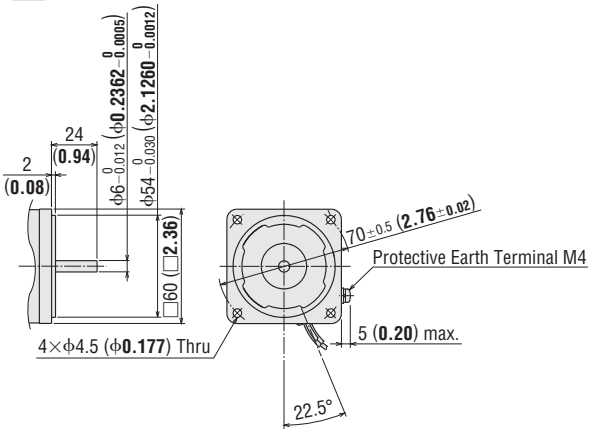
◇Shaft Section of Round Shaft Type

The motor's dimensions (excluding the shaft section) are the same as those of the pinion shaft types.

2TK3A-AW2U
2TK3A-CW2E

Mass: 0.7 kg (1.54 lb.)

DXF A444



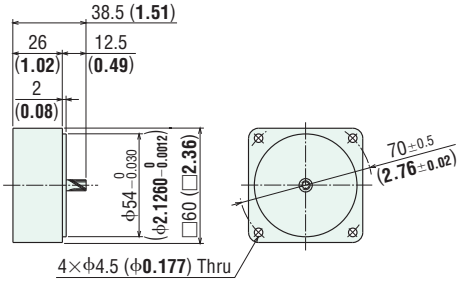
◇Decimal Gearhead

Can be connected to **2TK3GN** type.

2GN10XS

Mass: 0.2 kg (0.44 lb.)

DXF A003



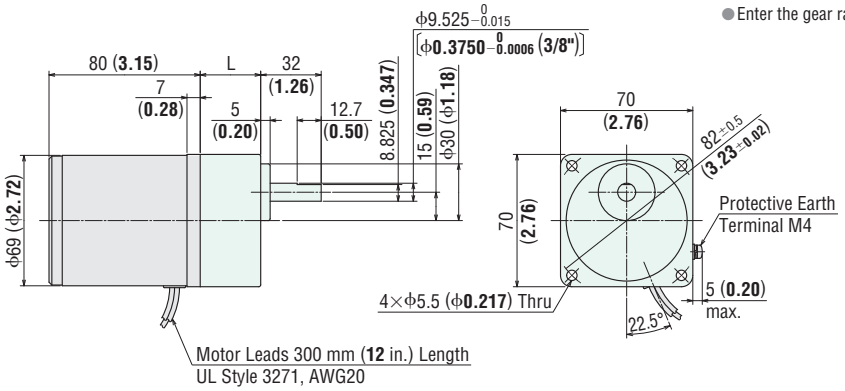
●6 W (1/125 HP)

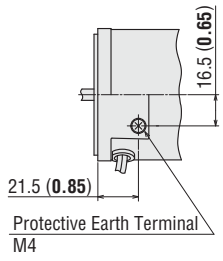
◇Motor/Gearhead

Mass: Motor 1.1 kg (2.4 lb.)
Gearhead 0.55 kg (1.21 lb.)

Motor Model	Gearhead Model	Gear Ratio	L	DXF
3TK6GN-AW2U **3TK6GN-CW2E**	**3GN□SA**	**3~18**	32 (1.26)	A447AU
		25~180	42 (1.65)	A447BU

●Enter the gear ratio in the box (□) within the model name.





Detail Drawing of Protective Earth Terminal

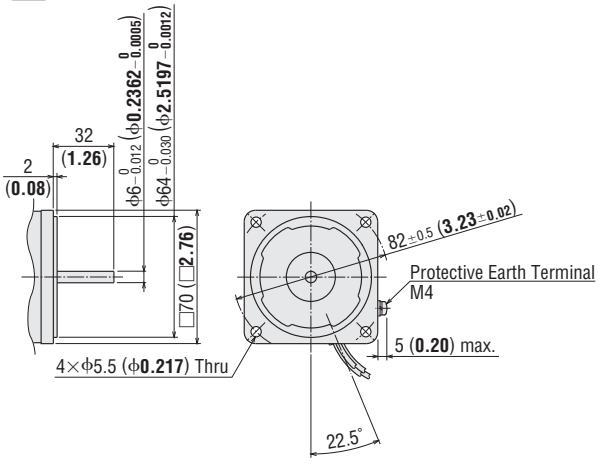
◇Shaft Section of Round Shaft Type

The motor's dimensions (excluding the shaft section) are the same as those of the pinion shaft types.

3TK6A-AW2U
3TK6A-CW2E

Mass: 1.1 kg (2.4 lb.)

DXF A448



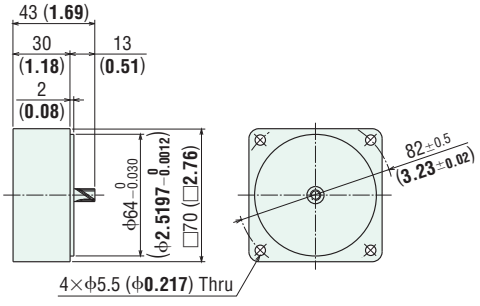
◇Decimal Gearhead

Can be connected to **3TK6GN** type.

3GN10XS

Mass: 0.3 kg (0.66 lb.)

DXF A009



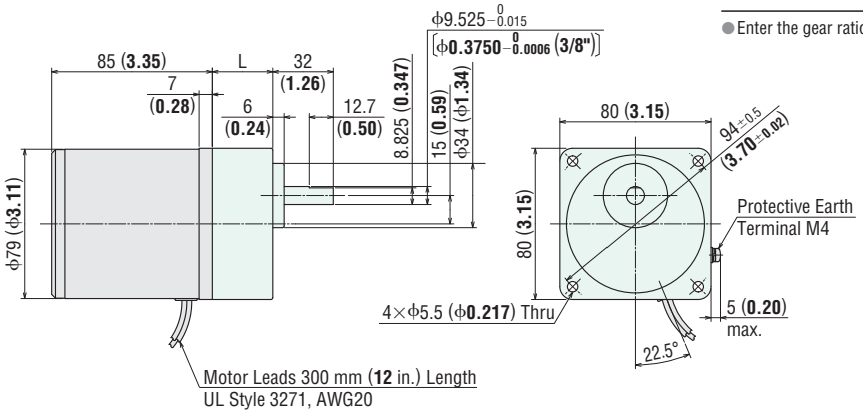
●10 W (1/75 HP)

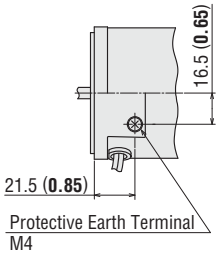
◇Motor/Gearhead

Mass: Motor 1.5 kg (3.3 lb.)
Gearhead 0.65 kg (1.43 lb.)

Motor Model	Gearhead Model	Gear Ratio	L	DXF
4TK10GN-AW2U **4TK10GN-CW2E**	**4GN□SA**	**3~18**	32 (1.26)	A449AU
		25~180	42.5 (1.67)	A449BU

●Enter the gear ratio in the box (□) within the model name.





Detail Drawing of Protective Earth Terminal

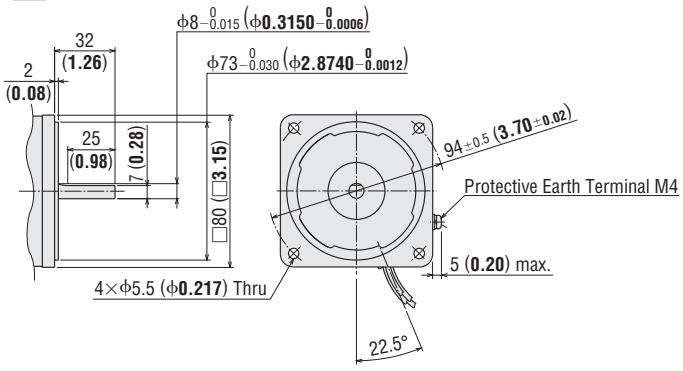
◇Shaft Section of Round Shaft Type

The motor's dimensions (excluding the shaft section) are the same as those of the pinion shaft types.

4TK10A-AW2U
4TK10A-CW2E

Mass: 1.5 kg (3.3 lb.)

DXF A450



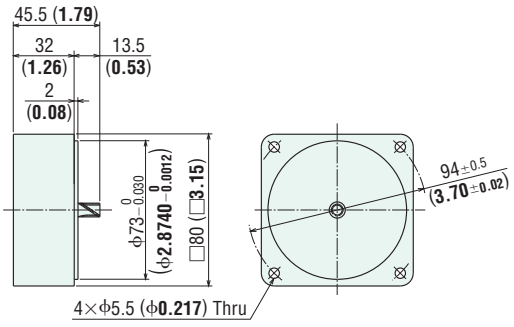
◇Decimal Gearhead

Can be connected to **4TK10GN** type.

4GN10XS

Mass: 0.4 kg (0.88 lb.)

DXF A013



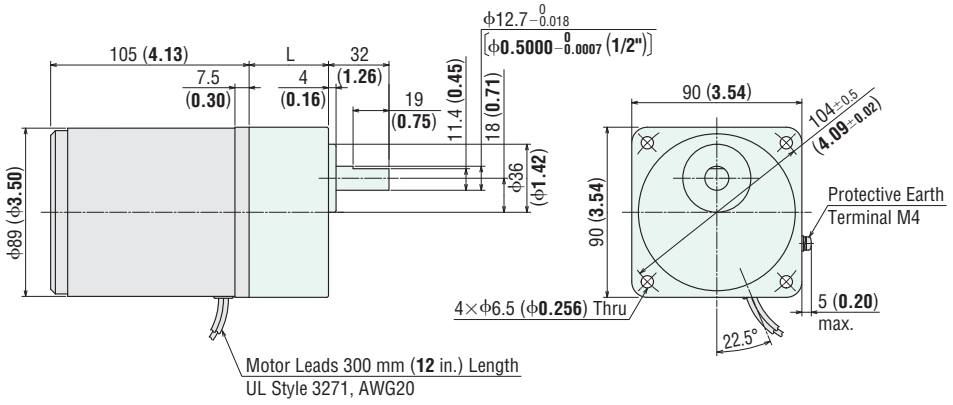
●20 W (1/38 HP)

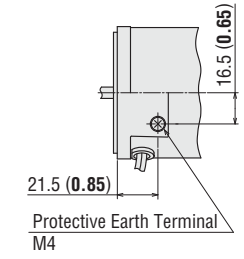
◇Motor/Gearhead

Mass: Motor 2.5 kg (5.5 lb.)
Gearhead 1.5 kg (3.3 lb.)

Motor Model	Gearhead Model	Gear Ratio	L	DXF
5TK20GN-AW2U **5TK20GN-CW2E**	**5GN□SA**	**3**～**18**	42 (1.65)	A452AU
		25～**180**	60 (2.36)	A452BU

●Enter the gear ratio in the box (□) within the model name.





Detail Drawing of Protective Earth Terminal

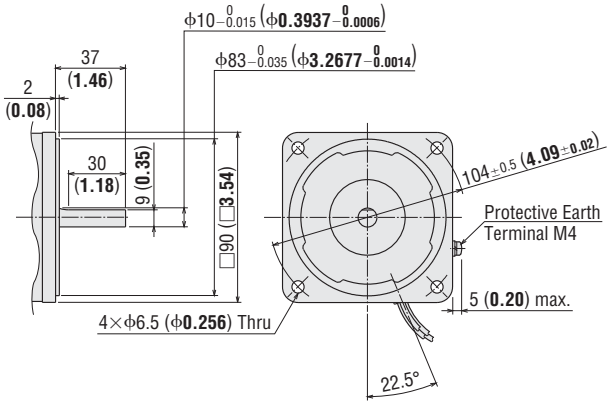
◇Shaft Section of Round Shaft Type

The motor's dimensions (excluding the shaft section) are the same as those of the pinion shaft types.

5TK20A-AW2U
5TK20A-CW2E

Mass: 2.5 kg (5.5 lb.)

DXF A453



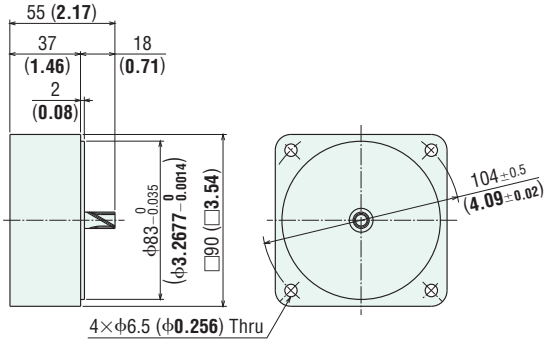
◇Decimal Gearhead

Can be connected to **5TK20GN** type.

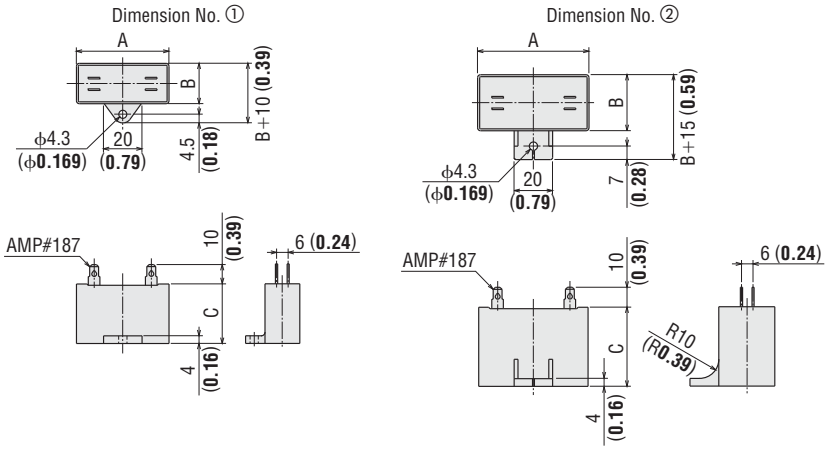
5GN10XS

Mass: 0.6 kg (1.32 lb.)

DXF A022



◇Capacitor (Included with the motors)



◇Capacitor Dimensions Unit = mm (in.)

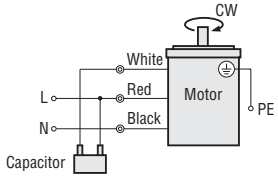
Model		Capacitor Model	A	B	C	Mass g (oz.)	Dimension No.	Capacitor Cap
Pinion Shaft Type	Round Shaft Type							
2TK3GN-AW2U	**2TK3A-AW2U**	CH60CFAUL2	38 (1.50)	21 (0.83)	31 (1.22)	35 (1.24)	①	Included
2TK3GN-CW2E	**2TK3A-CW2E**	CH15BFAUL	38 (1.50)	21 (0.83)	31 (1.22)	37 (1.31)	①	
3TK6GN-AW2U	**3TK6A-AW2U**	CH90CFAUL2	48 (1.89)	22.5 (0.89)	31.5 (1.24)	45 (1.59)	①	
3TK6GN-CW2E	**3TK6A-CW2E**	CH25BFAUL	48 (1.89)	21 (0.83)	31 (1.22)	42 (1.48)	①	
4TK10GN-AW2U	**4TK10A-AW2U**	CH110CFAUL2	58 (2.28)	21 (0.83)	31 (1.22)	49 (1.73)	①	
4TK10GN-CW2E	**4TK10A-CW2E**	CH30BFAUL	58 (2.28)	21 (0.83)	31 (1.22)	50 (1.77)	①	
5TK20GN-AW2U	**5TK20A-AW2U**	CH140CFAUL2	58 (2.28)	22 (0.87)	35 (1.38)	61 (2.2)	①	
5TK20GN-CW2E	**5TK20A-CW2E**	CH40BFAUL	58 (2.28)	23.5 (0.93)	37 (1.46)	73 (2.6)	②	

Connection Diagrams

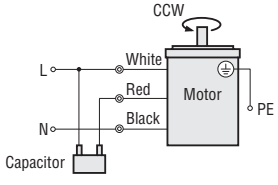
- The direction of motor rotation is as viewed from the shaft end of the motor. CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft type.

2TK3GN-AW2U, **2TK3GN-CW2E**, **3TK6GN-AW2U**, **3TK6GN-CW2E**
4TK10GN-AW2U, **4TK10GN-CW2E**, **5TK20GN-AW2U**, **5TK20GN-CW2E**

Clockwise



Counterclockwise



PE: Protective Earth

● How to connect a capacitor ➜ Page A-313