Oriental motor

NEW PRODUCTS

RoHS RoHS-Compliant

Speed Controller

ES01/ES02

RoHS RoHS-Compliant

Speed Controller

ES01/ES02

ES01 and **ES02** are speed controllers designed for ultimate ease of use when operating and wiring, focusing on the functions required for speed control. A wide range of speed control motors from the **V** Series and the World **K** Series are available for use with this controller.

Features

Multi-Functions

Provide the functions necessary for speed control.

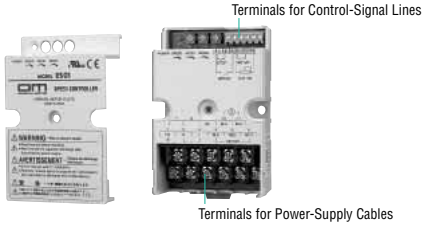
· Speed control 90 to 1400 r/min (50 Hz)
90 to 1600 r/min (60 Hz)
· Instantaneous stop
· Acceleration/deceleration function that enables smooth start and stop

Can be Used World-Wide

The **ES01**/**ES02** speed controller conforms to major power supply specifications world-wide. It is recognized by UL and CSA, while CE Marking is used in accordance with the EMC Directive and Low Voltage Directive.

Simple Wiring

For easy wiring the new design provides separate terminals for power-supply cables and control-signal lines.



Controlling 6 W (1/125 HP) to 90 W (1/8 HP) Motors with a Single Unit

One **ES01**/**ES02** unit is all you need to operate speed control motors with varying output of 6 W (1/125 HP) to 90 W (1/8 HP).

IP20-Compliant

Case design against electric shock and the IP20-compliant construction prevent the operator from touching the terminal block, thereby ensuring a high degree of safety.

RoHS RoHS-Compliant

ES01/**ES02** and the applicable speed control motors conform to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

RoHS (Restriction of Hazardous Substances) Directive:
Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the EU member states. The six controlled substances are: lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE).

Product Line

Speed Controller RoHS

Model	Power Supply Voltage
ES01	Single-Phase 100/115 VAC
ES02	Single-Phase 200/230 VAC

Safety Standards and CE Marking

Speed Controller **ES01**/**ES02**

Applicable Standard	Certification Body	Standards File No.	CE Marking
UL 508 CSA C22.2 No.14	UL	E91291	Low Voltage Directives EMC Directives
EN 50178 EN 60950-1	Conform to EN Standards		

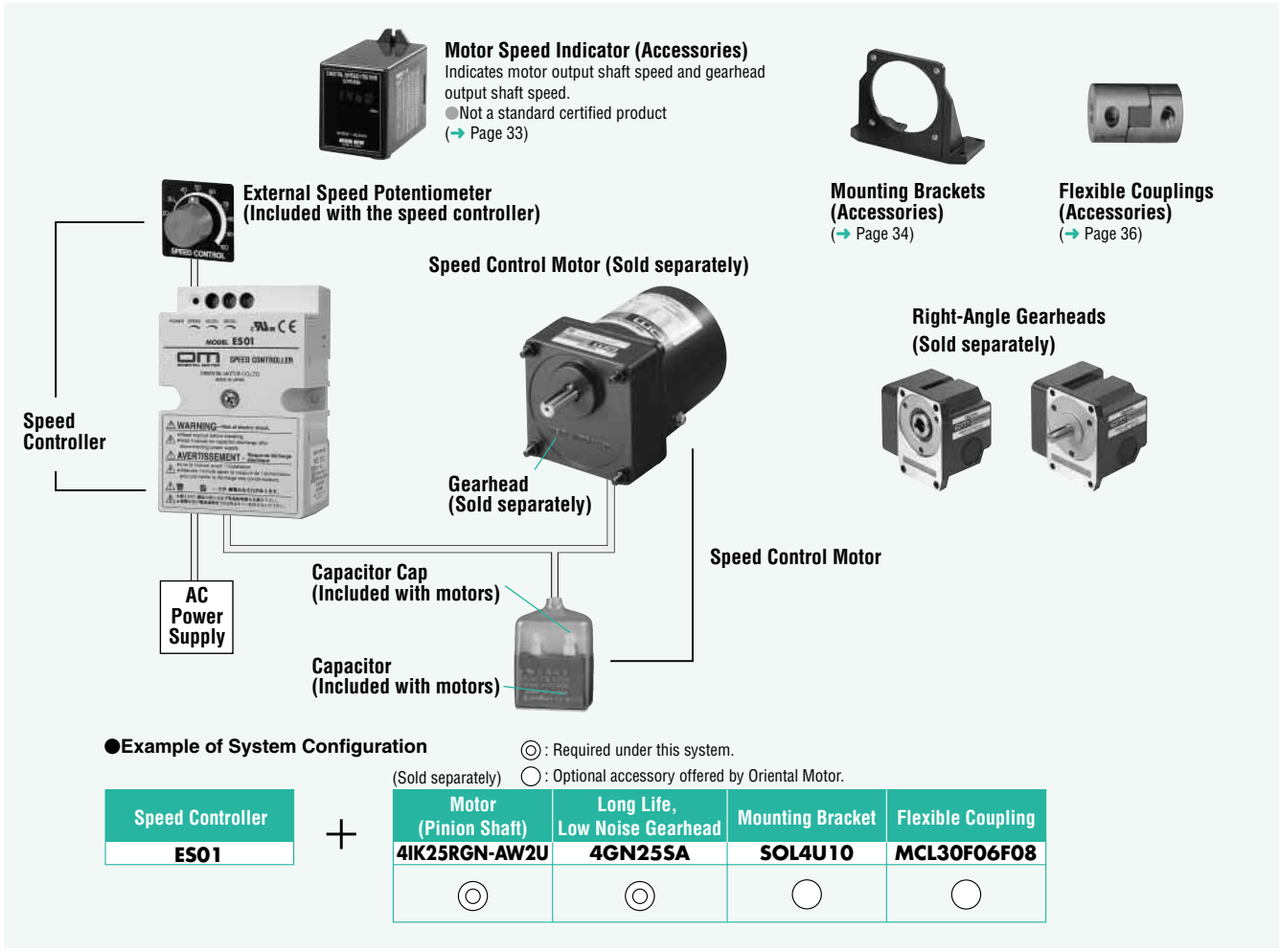
● The EMC value changes according to the wiring and layout. Therefore, the final EMC level must be checked with the motor/speed controller incorporated in the user's equipment.

Specifications of Speed Controller RoHS

Model Name	**ES01**	**ES02**
Power Supply Voltage	Single-Phase 100-115 VAC ±10%	Single-Phase 200-230 VAC ±10%
Power Supply Frequency	50/60 Hz	
Applicable Speed Control Motor Output Power	**V** Series: 6 W (1/125 HP), 15 W (1/50 HP), 25 W (1/30 HP), 40 W (1/19 HP), 60 W (1/12 HP), 90 W (1/8 HP) World **K** Series: 6 W (1/125 HP), 15 W (1/50 HP), 25 W (1/30 HP), 40 W (1/19 HP), 60 W (1/12 HP)	
Variable Speed Range	50 Hz: 90 to 1400 r/min 60 Hz: 90 to 1600 r/min	
Function	Speed control, Instantaneous stop, Acceleration/deceleration	
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the case and all the pins, the FG terminal and the AC input terminals under normal ambient temperature and humidity.	
Dielectric Strength	Sufficient to withstand 1.5 kV at 50 Hz or 60 Hz applied between the FG terminal and the AC input terminals for 1 minute under normal ambient temperature and humidity. Sufficient to withstand 3.0 kV at 50 Hz or 60 Hz applied between all the pins and the case for 1 minute.	
Ambient Temperature	0～+40°C (+32～+104°F) (non-freezing)	
Ambient Humidity	85% or less (non-condensing)	
Degree of Protection	IP20 (with cover)	

Note:
These models cannot be used for applications requiring the control of more than one motor/controller set by the same external speed potentiometer.
When instantaneous stop is activated, a large braking current will flow to the motor. Braking current → Page 30

System Configuration



●**Example of System Configuration**

◎: Required under this system.
○: Optional accessory offered by Oriental Motor.

Speed Controller	+	(Sold separately) Motor (Pinion Shaft)	Long Life, Low Noise Gearhead	Mounting Bracket	Flexible Coupling
ES01		4IK25RGN-AW2U	4GN25SA	SOL4U10	MCL30F06F08
		◎	◎	○	○

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

Applicable Speed Control Motor (Sold separately) RoHS

●V Series

Speed Control Motor 6 W (1/125 HP) to 90 W (1/8 HP)

The **V** Series speed control motors provide low noise operation, long life and high strength performance. Combination types, which come with the motor and its gearhead pre-assembled, are available.

Product line ➜ Page 4

●World K Series

Speed Control Motor 6 W (1/125 HP) to 60 W (1/12 HP)

Conforming to major safety standards, the World **K** Series sets the standard for AC motors. These motors can be used in wide-ranging applications. The new "long life, low noise **GN-S** gearhead" achieves a long rated life of 10000 hours, twice the level of a conventional gearhead, by adopting innovative technologies and structure. These gearheads are highly reliable and require less maintenance.

Product line ➜ Page 5

Safety Standards and CE Marking

●Applicable Speed Control Motor

Applicable Standard	Certification Body	Standards File No.	CE Marking
UL 1004 UL 2111 CSA C22.2 No.100 CSA C22.2 No.77	UL	E64199 [6 W (1/125 HP) type] E64197 [15 W (1/50 HP) to 90 W (1/8 HP) type]	Low Voltage Directives
EN 60950-1 EN 60034-1 EN 60034-5 IEC 60664-1	Conform to EN/IEC Standards		
GB 12350*	CQC	2003010401091525 [Single-Phase 6 W (1/125 HP)] 2003010401091522 [Single-Phase 15 W (1/50 HP) to 40 W (1/19 HP)]	

●When the motor is approved under various standards, the model name on the nameplate is the approved model name.
*The 60 W (1/12 HP) type and 90 W (1/8 HP) type are not CCC certified products.

Product Number Code

●V Series Speed Control Motor

◇Motor (Combination type, pinion shaft type)

V S I 4 25 A2 - □ U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①	Series	**V**: **V** Series
②	Speed Control Motor	
③	Motor Type	**I**: Induction Motor **R**: Reversible Motor
④	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.)
⑤	Output Power (W)	(Example) **25**: 25 W (1/30 HP)
⑥	Power Supply Voltage	**A2**, **A**: Single-Phase 110/115 VAC, RoHS-Compliant **C2**, **C**: Single-Phase 220/230 VAC, RoHS-Compliant
⑦	Motor Shaft Type, Gear Ratio	Number: Gear Ratio (Combination Type) **GV**: **GV** Type Pinion Shaft **GVH**: **GVH** Type Pinion Shaft **GVR**: **GVR** Type Pinion Shaft
⑧	Included Capacitor	**U**: For Single-Phase 110/115 VAC **E**: For Single-Phase 220/230 VAC

◇Gearhead

GV 4G 50

① ② ③

①	Type of Pinion	**GV**: **GV** Type Pinion, RoHS-Compliant **GVH**: **GVH** Type Pinion, RoHS-Compliant **GVR**: **GVR** Type Pinion, RoHS-Compliant
②	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.)
③	Gear Ratio	(Example) **50**: Gear Ratio of 50:1

Product Line

●V Series Speed Control Motor

◇Combination Type [6 W (1/125 HP) to 25 W (1/30 HP)] RoHS (Combination types come with the motor and gearhead pre-assembled.)

Type	Power Supply Voltage	□60 mm (2.36 in.) 6 W (1/125 HP) Model	□70 mm (2.76 in.) 15 W (1/50 HP) Model	□80 mm (3.15 in.) 25 W (1/30 HP) Model	Applicable Controller (Sold separately)
Induction Motor	Single-Phase 110/115 VAC	**VSI206A2-5～360U**	**VSI315A2-5～360U**	**VSI425A2-5～360U**	**ES01**
	Single-Phase 220/230 VAC	**VSI206C2-5～360E**	**VSI315C2-5～360E**	**VSI425C2-5～360E**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**VSR206A2-5～360U**	**VSR315A2-5～360U**	**VSR425A2-5～360U**	**ES01**
	Single-Phase 220/230 VAC	**VSR206C2-5～360E**	**VSR315C2-5～360E**	**VSR425C2-5～360E**	**ES02**

◇Combination Type [40 W (1/19 HP) to 90 W (1/8 HP)] RoHS (Combination types come with the motor and gearhead pre-assembled.)

Type	Power Supply Voltage	□90 mm (3.54 in.) 40 W (1/19 HP) Model	□90 mm (3.54 in.) 60 W (1/12 HP) Model	□90 mm (3.54 in.) 90 W (1/8 HP) Model	Applicable Controller (Sold separately)
Induction Motor	Single-Phase 110/115 VAC	**VSI540A2-5～300U**	**VSI560A-5～300U**	**VSI590A-5～180U**	**ES01**
	Single-Phase 220/230 VAC	**VSI540C2-5～300E**	**VSI560C-5～300E**	**VSI590C-5～180E**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**VSR540A2-5～300U**	**VSR560A-5～300U**	**VSR590A-5～180U**	**ES01**
	Single-Phase 220/230 VAC	**VSR540C2-5～300E**	**VSR560C-5～300E**	**VSR590C-5～180E**	**ES02**

◇Pinion Shaft Type Motor/Gearhead [6 W (1/125 HP) to 25 W (1/30 HP)] RoHS (Motors and gearheads are sold separately.)

Type	Power Supply Voltage	□60 mm (2.36 in.) 6 W (1/125 HP) Model	□70 mm (2.76 in.) 15 W (1/50 HP) Model	□80 mm (3.15 in.) 25 W (1/30 HP) Model	Applicable Controller (Sold separately)
Induction Motor	Single-Phase 110/115 VAC	**VSI206A2-GVU**	**VSI315A2-GVU**	**VSI425A2-GVU**	**ES01**
	Single-Phase 220/230 VAC	**VSI206C2-GVE**	**VSI315C2-GVE**	**VSI425C2-GVE**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**VSR206A2-GVU**	**VSR315A2-GVU**	**VSR425A2-GVU**	**ES01**
	Single-Phase 220/230 VAC	**VSR206C2-GVE**	**VSR315C2-GVE**	**VSR425C2-GVE**	**ES02**
Gearhead (Sold separately)		**GV2G5～360**	**GV3G5～360**	**GV4G5～360**	–

◇Pinion Shaft Type Motor/Gearhead [40 W (1/19 HP) to 90 W (1/8 HP)] RoHS (Motors and gearheads are sold separately.)

Type	Power Supply Voltage	□90 mm (3.54 in.) 40 W (1/19 HP) Model	□90 mm (3.54 in.) 60 W (1/12 HP) Model	□90 mm (3.54 in.) 90 W (1/8 HP) Model	Applicable Controller (Sold separately)
Induction Motor	Single-Phase 110/115 VAC	**VSI540A2-GVHU**	**VSI560A-GVHU**	**VSI590A-GVRU**	**ES01**
	Single-Phase 220/230 VAC	**VSI540C2-GVHE**	**VSI560C-GVHE**	**VSI590C-GVRE**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**VSR540A2-GVHU**	**VSR560A-GVHU**	**VSR590A-GVRU**	**ES01**
	Single-Phase 220/230 VAC	**VSR540C2-GVHE**	**VSR560C-GVHE**	**VSR590C-GVRE**	**ES02**
Gearhead (Sold separately)		**GVH5G5～300**	**GVH5G5～300**	**GVR5G5～180**	–

●Motor specifications, motor dimensions and gearhead dimensions are the same as those of the combination type.

Product Number Code

World **K** Series Speed Control Motor

◇Motor

4 I K 25 R GN - AW2 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	**I**: Induction Motor **R**: Reversible Motor
③	Series	**K**: **K** Series
④	Output Power (W)	(Example) **25**: 25 W (1/30 HP)
⑤	Speed Control Motor	
⑥	Motor Shaft Type, Type of Pinion	**GN**: **GN** Type Pinion Shaft **GU**: **GU** Type Pinion Shaft **A**: Round Shaft
⑦	Power Supply Voltage	**AW2**, **AW**: Single-Phase 110/115 VAC, RoHS-Compliant **CW2**, **CW**: Single-Phase 220/230 VAC, RoHS-Compliant
⑧	Included Capacitor	**U**: For Single-Phase 110/115 VAC **E**: For Single-Phase 220/230 VAC

◇Gearhead

4 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 **GU**: **GU** Type Pinion
③	Gear Ratio	(Example) **25**: Gear Ratio of 25:1 **10X** denotes the decimal gearhead of gear ratio 10:1
④	**GN** Type Pinion	**SA**: Long Life, Low Noise **GN-S** Gearhead, RoHS-Compliant **RH**: Right-Angle, Hollow Shaft Gearhead, RoHS-Compliant **RAA**: Right-Angle, Solid Shaft Gearhead, RoHS-Compliant
	GU Type Pinion	**KA**: **GU** Gearhead (Box type), RoHS-Compliant **RH**: Right-Angle, Hollow Shaft Gearhead, RoHS-Compliant **RAA**: Right-Angle, Solid Shaft Gearhead, RoHS-Compliant

Product Line

World **K** Series Speed Control Motor

◇Pinion Shaft Type [6 W (1/125 HP) to 60 W (1/12 HP)] RoHS

Type	Power Supply Voltage	□60 mm (2.36 in.) 6 W (1/125 HP)	□70 mm (2.76 in.) 15 W (1/50 HP)	□80 mm (3.15 in.) 25 W (1/30 HP)	□90 mm (3.54 in.) 40 W (1/19 HP)	□90 mm (3.54 in.) 60 W (1/12 HP)	Applicable Controller (Sold separately)
		Model	Model	Model	Model	Model	
Induction Motor	Single-Phase 110/115 VAC	**2IK6RGN-AW2U**	**3IK15RGN-AW2U**	**4IK25RGN-AW2U**	**5IK40RGN-AW2U**	**5IK60RGU-AWU**	**ES01**
	Single-Phase 220/230 VAC	**2IK6RGN-CW2E**	**3IK15RGN-CW2E**	**4IK25RGN-CW2E**	**5IK40RGN-CW2E**	**5IK60RGU-CWE**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**2RK6RGN-AW2U**	**3RK15RGN-AW2U**	**4RK25RGN-AW2U**	**5RK40RGN-AW2U**	**5RK60RGU-AWU**	**ES01**
	Single-Phase 220/230 VAC	**2RK6RGN-CW2E**	**3RK15RGN-CW2E**	**4RK25RGN-CW2E**	**5RK40RGN-CW2E**	**5RK60RGU-CWE**	**ES02**

Parallel Shaft Gearhead (Sold separately)

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

Applicable Motor Output Power (Pinion shaft)	Gearhead Model	Gear Ratio
6 W (1/125 HP)	**2GN□SA**	**3**~**180**
	2GN10XS (Decimal gearhead)	
15 W (1/50 HP)	**3GN□SA**	**3**~**180**
	3GN10XS (Decimal gearhead)	
25 W (1/30 HP)	**4GN□SA**	**3**~**180**
	4GN10XS (Decimal gearhead)	
40 W (1/19 HP)	**5GN□SA**	**3**~**180**
	5GN10XS (Decimal gearhead)	

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

◇**GU** Gearhead RoHS

Applicable Motor Output Power (Pinion shaft)	Gearhead Model	Gear Ratio
60 W (1/12 HP)	**5GU□KA**	**3**~**180**
	5GU10XKB (Decimal gearhead)	

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

Right-Angle Gearhead (Sold separately)

◇Hollow Shaft Type RoHS

Applicable Motor Output Power (Pinion shaft)	Gearhead Model	Gear Ratio
25 W (1/30 HP)	**4GN□RH**	**3**~**180**
40 W (1/19 HP)	**5GN□RH**	**3**~**180**
60 W (1/12 HP)	**5GU□RH**	**3**~**180**

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

◇Solid Shaft Type RoHS

Applicable Motor Output Power (Pinion shaft)	Gearhead Model	Gear Ratio
25 W (1/30 HP)	**4GN□RAA**	**3**~**180**
40 W (1/19 HP)	**5GN□RAA**	**3**~**180**
60 W (1/12 HP)	**5GU□RAA**	**3**~**180**

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

◇Round Shaft Type [6 W (1/125 HP) to 60 W (1/12 HP)] RoHS

Type	Power Supply Voltage	□60 mm (2.36 in.) 6 W (1/125 HP)	□70 mm (2.76 in.) 15 W (1/50 HP)	□80 mm (3.15 in.) 25 W (1/30 HP)	□90 mm (3.54 in.) 40 W (1/19 HP)	□90 mm (3.54 in.) 60 W (1/12 HP)	Applicable Controller (Sold separately)
		Model	Model	Model	Model	Model	
Induction Motor	Single-Phase 110/115 VAC	**2IK6RA-AW2U**	**3IK15RA-AW2U**	**4IK25RA-AW2U**	**5IK40RA-AW2U**	**5IK60RA-AWU**	**ES01**
	Single-Phase 220/230 VAC	**2IK6RA-CW2E**	**3IK15RA-CW2E**	**4IK25RA-CW2E**	**5IK40RA-CW2E**	**5IK60RA-CWE**	**ES02**
Reversible Motor	Single-Phase 110/115 VAC	**2RK6RA-AW2U**	**3RK15RA-AW2U**	**4RK25RA-AW2U**	**5RK40RA-AW2U**	**5RK60RA-AWU**	**ES01**
	Single-Phase 220/230 VAC	**2RK6RA-CW2E**	**3RK15RA-CW2E**	**4RK25RA-CW2E**	**5RK40RA-CW2E**	**5RK60RA-CWE**	**ES02**

Specifications

The following specifications assume combination with an applicable speed control motor.

●V Series Induction Motors – Continuous Rating

◇Single-Phase 110/115 VAC Applicable Speed Controller: ES01 (RoHS)

Model / Combination Type	Max. Output Power W (HP)	Voltage VAC	Frequency Hz	Variable Speed Range*1 r/min	Permissible Torque 1200 r/min mN·m (oz-in)	Permissible Torque 90 r/min mN·m (oz-in)	Starting Torque mN·m (oz-in)	Current A	Power Consumption W	Capacitor μF
(ZP) VSI206A2-□U	6 (1/125)	Single-Phase 110	60	90～1600	50 (7.1)	34 (4.8)	40 (5.6)	0.280	29	2.5
		Single-Phase 115								
(TP) VSI315A2-□U	15 (1/50)	Single-Phase 110	60	90～1600	125 (17.7)	42 (5.9)	65 (9.2)	0.48	46	4.5
		Single-Phase 115								
(TP) VSI425A2-□U	25 (1/30)	Single-Phase 110	60	90～1600	185 (26)	50 (7.1)	120 (17.0)	0.75	58	6.5
		Single-Phase 115							69	
(TP) VSI540A2-□U	40 (1/19)	Single-Phase 110	60	90～1600	225 (31)	67 (9.5)	180 (25)	1.1	107	9.0
		Single-Phase 115					200 (28)			
(TP) VSI560A-□U	60 (1/12)	Single-Phase 110	60	90～1600	490 (69)	210 (29)	320 (45)	2.0	180	18
		Single-Phase 115								
(TP) VSI590A-□U	90 (1/8)	Single-Phase 110	60	90～1600	730 (103)	210 (29)	410 (58)	2.6	240	20
		Single-Phase 115					450 (63)			

◇Single-Phase 220/230 VAC Applicable Speed Controller: ES02 (RoHS)

Model / Combination Type	Max. Output Power W (HP)	Voltage VAC	Frequency Hz	Variable Speed Range*1 r/min	Permissible Torque 1200 r/min mN·m (oz-in)	Permissible Torque 90 r/min mN·m (oz-in)	Starting Torque mN·m (oz-in)	Current A	Power Consumption W	Capacitor μF
(ZP) VSI206C2-□E	6 (1/125)	Single-Phase 220	50	90～1400	36 (5.1)	33 (4.6)	35 (4.9)	0.135	29	0.6
			60	90～1600	50 (7.1)					
		Single-Phase 230	50	90～1400	40 (5.6)		40 (5.6)			
			60	90～1600	50 (7.1)					
(TP) VSI315C2-□E	15 (1/50)	Single-Phase 220	50	90～1400	110 (15.6)	38 (5.3)	65 (9.2)	0.23	43	1.0
			60	90～1600	125 (17.7)				46	
		Single-Phase 230	50	90～1400	115 (16.3)		75 (10.6)		44	
			60	90～1600	125 (17.7)		65 (9.2)		47	
(TP) VSI425C2-□E	25 (1/30)	Single-Phase 220	50	90～1400	205 (29)	40 (5.6)	110 (15.6)	0.37	70	1.5
			60	90～1600	160 (22)					
		Single-Phase 230	50	90～1400	205 (29)		120 (17.0)			
			60	90～1600	150 (21)					
(TP) VSI540C2-□E	40 (1/19)	Single-Phase 220	50	90～1400	300 (42)	75 (10.6)	190 (26)	0.55	96	2.3
			60	90～1600	280 (39)				104	
		Single-Phase 230	50	90～1400	320 (45)	70 (9.9)	200 (28)		99	
			60	90～1600	260 (36)				105	
(TP) VSI560C-□E	60 (1/12)	Single-Phase 220	50	90～1400	460 (65)	200 (28)	320 (45)	0.84	155	4.0
			60	90～1600	490 (69)	215 (30)		0.89	175	
		Single-Phase 230	50	90～1400	490 (69)	170 (24)		0.85	158	
			60	90～1600		180 (25)		0.89	172	
(TP) VSI590C-□E	90 (1/8)	Single-Phase 220	50	90～1400	720 (102)	260 (36)	450 (63)	1.2	209	6.0
			60	90～1600	730 (103)	280 (39)			232	
		Single-Phase 230	50	90～1400	730 (103)	245 (34)			211	
			60	90～1600		280 (39)			236	

●Enter the gear ratio in the box (□) within the model name of the combination type. Enter the shaft type **GV**, **GVH** or **GVR** in the box (□) within the model name of the pinion shaft type. The values for each specification apply to the motor only.

(ZP) : Impedance protected

(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 off before inspecting.

*1 The variable speed ranges shown are under no load conditions.

*2 China Compulsory Certification System (CCC System)

The 60 W (1/12 HP) type and 90 W (1/8 HP) type are not CCC certified products.

●V Series Reversible Motors – 30 Minute Rating

◇Single-Phase 110/115 VAC Applicable Speed Controller: ES01 (RoHS)

Model	Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
					1200 r/min	90 r/min				
Combination Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) VSR206A2-□U	6 (1/125)	Single-Phase 110	60	90～1600	50 (7.1)	50 (7.1)	45 (6.3)	0.330	33	3.5
		Single-Phase 115								
(TP) VSR315A2-□U	15 (1/50)	Single-Phase 110	60	90～1600	125 (17.7)	85 (12.0)	100 (14.2)	0.60	60	6.0
		Single-Phase 115								
(TP) VSR425A2-□U	25 (1/30)	Single-Phase 110	60	90～1600	205 (29)	110 (15.6)	140 (19.8)	0.93	92	8.0
		Single-Phase 115								
(TP) VSR540A2-□U	40 (1/19)	Single-Phase 110	60	90～1600	320 (45)	155 (22)	240 (34)	1.47	145	12
		Single-Phase 115					260 (36)			
(TP) VSR560A-□U	60 (1/12)	Single-Phase 110	60	90～1600	490 (69)	270 (38)	380 (53)	2.2	201	20
		Single-Phase 115								
(TP) VSR590A-□U	90 (1/8)	Single-Phase 110	60	90～1600	730 (103)	320 (45)	590 (83)	3.0	272	30
		Single-Phase 115								

◇Single-Phase 220/230 VAC Applicable Speed Controller: ES02 (RoHS)

Model	Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
					1200 r/min	90 r/min				
Combination Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) VSR206C2-□E	6 (1/125)	Single-Phase 220	50	90～1400	42 (5.9)	50 (7.1)	45 (6.3)	0.155	34	0.8
			60	90～1600	50 (7.1)					
		Single-Phase 230	50	90～1400	46 (6.5)		50 (7.1)			
			60	90～1600	50 (7.1)		45 (6.3)			
(TP) VSR315C2-□E	15 (1/50)	Single-Phase 220	50	90～1400	125 (17.7)	87 (12.3)	100 (14.2)	0.30	63	1.5
			60	90～1600						
		Single-Phase 230	50	90～1400						
			60	90～1600						
(TP) VSR425C2-□E	25 (1/30)	Single-Phase 220	50	90～1400	205 (29)	115 (16.3)	140 (19.8)	0.50	95	2.5
			60	90～1600		110 (15.9)				
		Single-Phase 230	50	90～1400		115 (16.3)	155 (22)			
			60	90～1600		110 (15.6)	140 (19.8)			
(TP) VSR540C2-□E	40 (1/19)	Single-Phase 220	50	90～1400	320 (45)	180 (25)	270 (38)	0.75	140	3.5
			60	90～1600		170 (24)	260 (36)			
		Single-Phase 230	50	90～1400		170 (24)	270 (38)			
			60	90～1600			260 (36)			
(TP) VSR560C-□E	60 (1/12)	Single-Phase 220	50	90～1400	490 (69)	280 (39)	420 (59)	1.0	185	5.0
			60	90～1600			380 (53)		198	
		Single-Phase 230	50	90～1400			460 (65)	1.0	188	
			60	90～1600			380 (53)	1.1	202	
(TP) VSR590C-□E	90 (1/8)	Single-Phase 220	50	90～1400	670 (95)	360 (51)	600 (85)	1.3	240	7.0
			60	90～1600	730 (103)		590 (83)	1.4	260	
		Single-Phase 230	50	90～1400	730 (103)	350 (49)	600 (85)	1.3	240	
			60	90～1600			590 (83)	1.4	262	

- Enter the gear ratio in the box (□) within the model name of the combination type. Enter the shaft type **GV**, **GVH** or **GVR** in the box (□) within the model name of the pinion shaft type. The values for each specification apply to the motor only.
- The permissible torque and the starting torque of reversible motors are shown without the friction brake installed. Please keep in mind that you should select a suitable motor with enough torque, when designing the equipment.

(ZP) : Impedance protected

(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 off before inspecting.

*1 The variable speed ranges shown are under no load conditions.

*2 China Compulsory Certification System (CCC System)
The 60 W (1/12 HP) type and 90 W (1/8 HP) type are not CCC certified products.

●World **K** Series Induction Motors – Continuous Rating

◇Single-Phase 110/115 VAC Applicable Speed Controller: **ES01** (RoHS)

Model		Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
						1200 r/min	90 r/min				
Pinion Shaft Type	Round Shaft Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) **2IK6RGN-AW2U**	**2IK6RA-AW2U**	6 (1/125)	Single-Phase 110	60	90～1600	50 (7.1)	34 (4.8)	40 (5.6)	0.270	27	2.5
			Single-Phase 115								
(TP) **3IK15RGN-AW2U**	**3IK15RA-AW2U**	15 (1/50)	Single-Phase 110	60	90～1600	125 (17.7)	42 (5.9)	65 (9.2)	0.48	46	4.5
			Single-Phase 115								
(TP) **4IK25RGN-AW2U**	**4IK25RA-AW2U**	25 (1/30)	Single-Phase 110	60	90～1600	185 (26)	50 (7.1)	120 (17.0)	0.75	58	6.5
			Single-Phase 115							69	
(TP) **5IK40RGN-AW2U**	**5IK40RA-AW2U**	40 (1/19)	Single-Phase 110	60	90～1600	225 (31)	67 (9.5)	180 (25)	1.1	107	9.0
			Single-Phase 115					200 (28)			
(TP) **5IK60RGU-AWU**	**5IK60RA-AWU**	60 (1/12)	Single-Phase 110	60	90～1600	490 (69)	210 (29)	320 (45)	2.0	180	18
			Single-Phase 115								

◇Single-Phase 220/230 VAC Applicable Speed Controller: **ES02** (RoHS)

Model		Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
						1200 r/min	90 r/min				
Pinion Shaft Type	Round Shaft Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) **2IK6RGN-CW2E**	**2IK6RA-CW2E**	6 (1/125)	Single-Phase 220	50	90～1400	36 (5.1)	33 (4.6)	35 (4.9)	0.130	27	0.6
				60	90～1600	50 (7.1)					
			Single-Phase 230	50	90～1400	40 (5.6)		40 (5.6)			
				60	90～1600	50 (7.1)					
(TP) **3IK15RGN-CW2E**	**3IK15RA-CW2E**	15 (1/50)	Single-Phase 220	50	90～1400	110 (15.6)	38 (5.3)	65 (9.2)	0.23	43	1.0
				60	90～1600	125 (17.7)				46	
			Single-Phase 230	50	90～1400	115 (16.3)		75 (10.6)		44	
				60	90～1600	125 (17.7)		65 (9.2)		47	
(TP) **4IK25RGN-CW2E**	**4IK25RA-CW2E**	25 (1/30)	Single-Phase 220	50	90～1400	205 (29)	40 (5.6)	110 (15.6)	0.37	70	1.5
				60	90～1600	160 (22)					
			Single-Phase 230	50	90～1400	205 (29)		120 (17.0)			
				60	90～1600	150 (21)					
(TP) **5IK40RGN-CW2E**	**5IK40RA-CW2E**	40 (1/19)	Single-Phase 220	50	90～1400	300 (42)	75 (10.6)	190 (26)	0.55	96	2.3
				60	90～1600	280 (39)				104	
			Single-Phase 230	50	90～1400	320 (45)	70 (9.9)	200 (28)		99	
				60	90～1600	260 (36)				105	
(TP) **5IK60RGU-CWE**	**5IK60RA-CWE**	60 (1/12)	Single-Phase 220	50	90～1400	460 (65)	200 (28)	320 (45)	0.84	155	4.0
				60	90～1600	490 (69)	215 (30)		0.89	175	
			Single-Phase 230	50	90～1400	490 (69)	170 (24)		0.85	158	
				60	90～1600		180 (25)		0.89	172	

(ZP) : Impedance protected

(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 off before inspecting.

*1 The variable speed ranges shown are under no load conditions.

*2 China Compulsory Certification System (CCC System)

The 60 W (1/12 HP) type is not a CCC certified product.

●World **K** Series Reversible Motors – 30 Minute Rating

◇Single-Phase 110/115 VAC Applicable Speed Controller: **ES01** (RoHS)

Model		Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
						1200 r/min	90 r/min				
Pinion Shaft Type	Round Shaft Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) **2RK6RGN-AW2U**	**2RK6RA-AW2U**	6 (1/125)	Single-Phase 110	60	90~1600	50 (7.1)	50 (7.1)	45 (6.3)	0.320	32	3.5
			Single-Phase 115								
(TP) **3RK15RGN-AW2U**	**3RK15RA-AW2U**	15 (1/50)	Single-Phase 110	60	90~1600	125 (17.7)	85 (12.0)	100 (14.2)	0.60	60	6.0
			Single-Phase 115								
(TP) **4RK25RGN-AW2U**	**4RK25RA-AW2U**	25 (1/30)	Single-Phase 110	60	90~1600	205 (29)	110 (15.6)	140 (19.8)	0.93	92	8.0
			Single-Phase 115								
(TP) **5RK40RGN-AW2U**	**5RK40RA-AW2U**	40 (1/19)	Single-Phase 110	60	90~1600	320 (45)	155 (22)	240 (34)	1.47	145	12
			Single-Phase 115					260 (36)			
(TP) **5RK60RGU-AWU**	**5RK60RA-AWU**	60 (1/12)	Single-Phase 110	60	90~1600	490 (69)	270 (38)	380 (53)	2.2	201	20
			Single-Phase 115								

◇Single-Phase 220/230 VAC Applicable Speed Controller: **ES02** (RoHS)

Model		Max. Output Power	Voltage	Frequency	Variable Speed Range*1	Permissible Torque		Starting Torque	Current	Power Consumption	Capacitor
						1200 r/min	90 r/min				
Pinion Shaft Type	Round Shaft Type	W (HP)	VAC	Hz	r/min	mN·m (oz-in)	mN·m (oz-in)	mN·m (oz-in)	A	W	μF
(ZP) **2RK6RGN-CW2E**	**2RK6RA-CW2E**	6 (1/125)	Single-Phase 220	50	90~1400	42 (5.9)	50 (7.1)	45 (6.3)	0.155	32	0.8
				60	90~1600	50 (7.1)					
			Single-Phase 230	50	90~1400	46 (6.5)		50 (7.1)			
				60	90~1600	50 (7.1)		45 (6.3)			
(TP) **3RK15RGN-CW2E**	**3RK15RA-CW2E**	15 (1/50)	Single-Phase 220	50	90~1400	125 (17.7)	87 (12.3)	100 (14.2)	0.30	63	1.5
				60	90~1600						
			Single-Phase 230	50	90~1400						
				60	90~1600						
(TP) **4RK25RGN-CW2E**	**4RK25RA-CW2E**	25 (1/30)	Single-Phase 220	50	90~1400	205 (29)	115 (16.3)	140 (19.8)	0.50	95	2.5
				60	90~1600		110 (15.6)				
			Single-Phase 230	50	90~1400		115 (16.3)	155 (22)			
				60	90~1600		110 (15.6)	140 (19.8)			
(TP) **5RK40RGN-CW2E**	**5RK40RA-CW2E**	40 (1/19)	Single-Phase 220	50	90~1400	320 (45)	180 (25)	270 (38)	0.75	140	3.5
				60	90~1600		170 (24)	260 (36)			
			Single-Phase 230	50	90~1400		170 (24)	270 (38)			
				60	90~1600			260 (36)			
(TP) **5RK60RGU-CWE**	**5RK60RA-CWE**	60 (1/12)	Single-Phase 220	50	90~1400	490 (69)	280 (39)	420 (59)	1.0	185	5.0
				60	90~1600			380 (53)		198	
			Single-Phase 230	50	90~1400			460 (65)	1.0	188	
				60	90~1600			380 (53)	1.1	202	

● The permissible torque and the starting torque of reversible motors are shown without the friction brake installed. Please keep in mind that you should select a suitable motor with enough torque, when designing the equipment.

(ZP) : Impedance protected

(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 off before inspecting.

*1 The variable speed ranges shown are under no load conditions.

*2 China Compulsory Certification System (CCC System)
The 60 W (1/12 HP) type is not a CCC certified product.

General Specifications of Applicable Speed Control Motors

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 kV 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 are 80˚C (144˚F) or less measured by the resistance change method after rated operation with no load under normal ambient temperature and humidity with connecting a gearhead or equivalent heat radiation plate* to a motor.
Insulation Class	Class B [130˚C (266˚F)]
Overheat Protection	6 W (1/125 HP) type has impedance protection. All others have built-in thermal protector (automatic return type). Operating temperature; 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 World **K** Series 60 W (1/12 HP): IP40

*Heat radiation plate (Material: Aluminum)

Motor Output Power	Size mm (in.)	Thickness mm (in.)
6 W (1/125 HP)	115×115 (4.53×4.53)	5 (0.20)
15 W (1/50 HP)	125×125 (4.92×4.92)	
25 W (1/30 HP)	135×135 (5.31×5.31)	
40 W (1/19 HP)	165×165 (6.50×6.50)	
60 W (1/12 HP)	200×200 (7.87×7.87)	

Variable Speed Range When Gearhead is Attached

V Series, World **K** Series

Unit = r/min

Series		World **K** Series		**V** Series																				
Gear Ratio		**3**	**3.6**	**5**	**6**	**7.5**	**9**	**12.5**	**15**	**18**	**25**	**30**	**36**	**50**	**60**	**75**	**90**	**100**	**120**	**150**	**180**	**250**	**300**	**360**
High Speed	50 Hz	466	388	280	233	186	155	112	93	77	56	46	38	28	23	18	15	14	11	9	7	5	4	3
	60 Hz	533	444	320	266	213	177	128	106	88	64	53	44	32	26	21	17	16	13	10	8.8	6.4	5.3	4.4
Low Speed		30	25	18	15	12	10	7.2	6	5	3.6	3	2.5	1.8	1.5	1.2	1	0.9	0.75	0.6	0.5	0.3	0.3	0.2

Gearmotor – Torque Table

- Gearheads of the World **K** Series are sold separately.
- With the World **K** Series, to reduce the speed beyond the gear ratio in the table, attach a decimal gearhead of gear ratio 10:1 (sold separately) between the gearhead and the motor. In that case, the permissible torques are as follows. (Decimal gearheads are not available for the **V** Series.)

2GN□SA: 3 N·m (26 lb-in), **3GN□SA**: 5 N·m (44 lb-in)
4GN□SA: 8 N·m (70 lb-in)[6 N·m (53 lb-in) when a gearhead of 25:1 to 36:1 is attached]
5GN□SA: 10 N·m (88 lb-in), **5GU□KA**: 20 N·m (177 lb-in)

- Enter the gear ratio in the box (□) within the model name.
- A colored background (▭) indicates gear shaft rotation in the same direction as the motor shaft, while the others rotate in the opposite direction.

●**V** Series Induction Motors

◇Single-Phase 110/115 VAC

Unit = N·m (lb-in)

Model / Combination Type	Gear Ratio / Speed	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
VSI206A2-□U	1200 r/min	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
	90 r/min	0.15 (1.32)	0.18 (1.59)	0.23 (2.0)	0.28 (2.4)	0.38 (3.3)	0.46 (4.0)	0.55 (4.8)	0.77 (6.8)	0.88 (7.7)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	2.9 (25)	3.5 (30)	4.1 (36)	5.0 (44)	6 (53)	6 (53)	6 (53)
VSI315A2-□U	1200 r/min	0.56 (4.9)	0.68 (6.0)	0.84 (7.4)	1.0 (8.8)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.2 (28)	3.9 (34)	5.4 (47)	6.5 (57)	8.1 (71)	9.7 (85)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	0.19 (1.68)	0.23 (2.0)	0.28 (2.4)	0.34 (3.0)	0.47 (4.1)	0.57 (5.0)	0.68 (6.0)	0.95 (8.4)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	3.6 (31)	4.3 (38)	5.1 (45)	6.1 (53)	8.5 (75)	10 (88)	10 (88)
VSI425A2-□U	1200 r/min	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	2.1 (18.5)	2.5 (22)	3.0 (26)	4.2 (37)	4.8 (42)	5.7 (50)	8.0 (70)	9.5 (84)	11.9 (105)	14.3 (126)	15.9 (140)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
	90 r/min	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6.1 (53)	7.3 (64)	10.1 (89)	12.2 (107)	14.6 (129)
VSI540A2-□U	1200 r/min	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.5 (22)	3.0 (26)	3.6 (31)	4.8 (42)	5.8 (51)	7.0 (61)	9.7 (85)	11.6 (102)	14.5 (128)	17.4 (153)	19.4 (171)	21.9 (193)	27.3 (241)	30 (260)	30 (260)	30 (260)	–
	90 r/min	0.30 (2.6)	0.36 (3.1)	0.45 (3.9)	0.54 (4.7)	0.75 (6.6)	0.90 (7.9)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.9 (25)	3.5 (30)	4.3 (38)	5.2 (46)	5.8 (51)	6.5 (57)	8.1 (71)	9.8 (86)	13.6 (120)	16.3 (144)	–
VSI560A-□U	1200 r/min	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.5 (48)	6.6 (58)	7.9 (69)	10.5 (92)	12.6 (111)	15.2 (134)	21.1 (186)	25.3 (223)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	0.95 (8.4)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.4 (21)	2.8 (24)	3.4 (30)	4.5 (39)	5.4 (47)	6.5 (57)	9.0 (79)	10.8 (95)	13.5 (119)	16.3 (144)	18.1 (160)	20.4 (180)	25.5 (220)	30 (260)	30 (260)	30 (260)	–
VSI590A-□U	1200 r/min	3.3 (29)	3.9 (34)	4.9 (43)	5.9 (52)	8.2 (72)	9.9 (87)	11.3 (100)	15.7 (138)	18.8 (166)	22.6 (200)	31.4 (270)	37.7 (330)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
	90 r/min	0.95 (8.4)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.4 (21)	2.8 (24)	3.3 (29)	4.5 (39)	5.4 (47)	6.5 (57)	9.0 (79)	10.8 (95)	12.8 (113)	15.3 (135)	17.0 (150)	20.4 (180)	25.5 (220)	30.6 (270)	–	–	–

◇Single-Phase 220/230 VAC

Unit = N·m (lb-in)

Model / Combination Type	Gear Ratio / Speed		5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
VSI206C2-□E	1200 r/min	220 VAC 50 Hz	0.16 (1.41)	0.19 (1.68)	0.24 (2.1)	0.29 (2.5)	0.41 (3.6)	0.49 (4.3)	0.58 (5.1)	0.81 (7.1)	0.93 (8.2)	1.1 (9.7)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.1 (27)	3.7 (32)	4.4 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)
		230 VAC 50 Hz	0.18 (1.59)	0.22 (1.94)	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.54 (4.7)	0.65 (5.7)	0.90 (7.9)	1.0 (8.8)	1.2 (10.6)	1.7 (15.0)	2.1 (18.5)	2.6 (23)	3.1 (27)	3.4 (30)	4.1 (36)	4.9 (43)	5.8 (51)	6 (53)	6 (53)	6 (53)
		60 Hz	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
	90 r/min		0.15 (1.32)	0.18 (1.59)	0.22 (1.94)	0.27 (2.3)	0.37 (3.2)	0.45 (3.9)	0.53 (4.6)	0.74 (6.5)	0.85 (7.5)	1.0 (8.8)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.6 (23)	2.8 (24)	3.4 (30)	4.0 (35)	4.8 (42)	6 (53)	6 (53)	6 (53)
VSI315C2-□E	1200 r/min	220 VAC 50 Hz	0.50 (4.4)	0.59 (5.2)	0.74 (6.5)	0.89 (7.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.5 (22)	2.8 (24)	3.4 (30)	4.7 (41)	5.7 (50)	7.1 (62)	8.5 (75)	9.5 (84)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		230 VAC 50 Hz	0.52 (4.6)	0.62 (5.4)	0.78 (6.9)	0.93 (8.2)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.6 (23)	3.0 (26)	3.6 (31)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	9.9 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		60 Hz	0.56 (4.9)	0.68 (6.0)	0.84 (7.4)	1.0 (8.8)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.2 (28)	3.9 (34)	5.4 (47)	6.5 (57)	8.1 (71)	9.7 (85)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min		0.17 (1.50)	0.21 (1.85)	0.26 (2.3)	0.31 (2.7)	0.43 (3.8)	0.51 (4.5)	0.62 (5.4)	0.86 (7.6)	0.98 (8.6)	1.2 (10.6)	1.6 (14.1)	2.0 (17.7)	2.5 (22)	2.9 (25)	3.3 (29)	3.9 (34)	4.6 (40)	5.5 (48)	7.7 (68)	9.2 (81)	10 (88)

◇Single-Phase 220/230 VAC

Unit = N·m (lb-in)

Model	Gear Ratio		5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
Combination Type	Speed																						
VSI425C2-□E	1200 r/min	50 Hz	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.3 (20)	2.8 (24)	3.3 (29)	4.6 (40)	5.3 (46)	6.3 (55)	8.8 (77)	10.6 (93)	13.2 (116)	15.9 (140)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
		220 VAC 60 Hz	0.72 (6.3)	0.86 (7.6)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.6 (31)	4.1 (36)	5.0 (44)	6.9 (61)	8.3 (73)	10.3 (91)	12.4 (109)	13.8 (122)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
		230 VAC 60 Hz	0.68 (6.0)	0.81 (7.1)	1.0 (8.8)	1.2 (10.6)	1.7 (15.0)	2.0 (17.7)	2.4 (21)	3.4 (30)	3.9 (34)	4.6 (40)	6.5 (57)	7.7 (68)	9.7 (85)	11.6 (102)	12.9 (114)	15.5 (137)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
	90 r/min		0.18 (1.59)	0.22 (1.94)	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.54 (4.7)	0.65 (5.7)	0.90 (7.9)	1.0 (8.8)	1.2 (10.6)	1.7 (15.0)	2.1 (18.5)	2.6 (23)	3.1 (27)	3.4 (30)	4.1 (36)	4.9 (43)	5.8 (51)	8.1 (71)	9.7 (85)	11.7 (103)
VSI540C2-□E	1200 r/min	220 VAC 50 Hz	1.4 (12.3)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	3.4 (30)	4.1 (36)	4.9 (43)	6.5 (57)	7.7 (68)	9.3 (82)	12.9 (114)	15.5 (137)	19.4 (171)	23.2 (200)	25.8 (220)	29.2 (250)	30 (260)	30 (260)	30 (260)	30 (260)	–
		220 VAC 60 Hz	1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.8 (33)	4.5 (39)	6.0 (53)	7.2 (63)	8.7 (76)	12.0 (106)	14.4 (127)	18.1 (160)	21.7 (192)	24.1 (210)	27.2 (240)	30 (260)	30 (260)	30 (260)	30 (260)	–
		230 VAC 50 Hz	1.4 (12.3)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.6 (31)	4.3 (38)	5.2 (46)	6.9 (61)	8.3 (73)	9.9 (87)	13.8 (122)	16.5 (146)	20.6 (182)	24.8 (210)	27.5 (240)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
		230 VAC 60 Hz	1.2 (10.6)	1.4 (12.3)	1.8 (15.9)	2.1 (18.5)	2.9 (25)	3.5 (30)	4.2 (37)	5.6 (49)	6.7 (59)	8.0 (70)	11.2 (99)	13.4 (118)	16.8 (148)	20.1 (177)	22.4 (198)	25.3 (223)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	220 VAC	0.34 (3.0)	0.41 (3.6)	0.51 (4.5)	0.61 (5.3)	0.84 (7.4)	1.0 (8.8)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.9 (34)	4.8 (42)	5.8 (51)	6.5 (57)	7.3 (64)	9.1 (80)	10.9 (96)	15.2 (134)	18.2 (161)	–
		230 VAC	0.32 (2.8)	0.38 (3.3)	0.47 (4.1)	0.57 (5.0)	0.79 (6.9)	0.95 (8.4)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	6.0 (53)	6.8 (60)	8.5 (75)	10.2 (90)	14.2 (125)	17.0 (150)	–
VSI560C-□E	1200 r/min	220 VAC 50 Hz	2.1 (18.5)	2.5 (22)	3.1 (27)	3.7 (32)	5.2 (46)	6.2 (54)	7.5 (66)	9.9 (87)	11.9 (105)	14.2 (125)	19.8 (175)	23.7 (200)	29.7 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
		220 VAC 60 Hz 230 VAC	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.5 (48)	6.6 (58)	7.9 (69)	10.5 (92)	12.6 (111)	15.2 (134)	21.1 (186)	25.3 (220)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	220 VAC 50 Hz	0.90 (7.9)	1.1 (9.7)	1.4 (12.3)	1.6 (14.1)	2.3 (20)	2.7 (23)	3.2 (28)	4.3 (38)	5.2 (46)	6.2 (54)	8.6 (76)	10.3 (91)	12.9 (114)	15.5 (137)	17.2 (152)	19.4 (171)	24.3 (210)	29.2 (250)	30 (260)	30 (260)	–
		220 VAC 60 Hz	0.97 (8.5)	1.2 (10.6)	1.5 (13.2)	1.7 (15.0)	2.4 (21)	2.9 (25)	3.5 (30)	4.6 (40)	5.5 (48)	6.7 (59)	9.2 (81)	11.1 (98)	13.9 (123)	16.6 (146)	18.5 (163)	20.9 (184)	26.1 (230)	30 (260)	30 (260)	30 (260)	–
		230 VAC 50 Hz	0.77 (6.8)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.7 (32)	4.4 (38)	5.3 (46)	7.3 (64)	8.8 (77)	11.0 (97)	13.2 (116)	14.6 (129)	16.5 (146)	20.7 (183)	24.8 (210)	30 (260)	30 (260)	–
		230 VAC 60 Hz	0.81 (7.1)	0.97 (8.5)	1.2 (10.6)	1.5 (13.2)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.9 (34)	4.6 (40)	5.6 (49)	7.7 (68)	9.3 (82)	11.6 (102)	13.9 (123)	15.5 (137)	17.5 (154)	21.9 (193)	26.2 (230)	30 (260)	30 (260)	–
VSI590C-□E	1200 r/min	220 VAC 50 Hz	3.2 (28)	3.9 (34)	4.9 (43)	5.8 (51)	8.1 (71)	9.7 (85)	11.1 (98)	15.5 (137)	18.6 (164)	22.3 (197)	31.0 (270)	37.2 (320)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
		220 VAC 60 Hz 230 VAC	3.3 (29)	3.9 (34)	4.9 (43)	5.9 (52)	8.2 (72)	9.9 (87)	11.3 (100)	15.7 (138)	18.8 (166)	22.6 (200)	31.4 (270)	37.7 (330)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
	90 r/min	220 VAC 50 Hz	1.2 (10.6)	1.4 (12.3)	1.8 (15.9)	2.1 (18.5)	2.9 (25)	3.5 (30)	4.0 (35)	5.6 (49)	6.7 (59)	8.0 (70)	11.2 (99)	13.4 (118)	15.8 (139)	19.0 (168)	21.1 (186)	25.3 (220)	31.6 (270)	37.9 (330)	–	–	–
		230 VAC 50 Hz	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.3 (29)	3.8 (33)	5.3 (46)	6.3 (55)	7.6 (67)	10.5 (92)	12.6 (111)	14.9 (131)	17.9 (158)	19.8 (175)	23.8 (210)	29.8 (260)	35.7 (310)	–	–	–
		220 VAC 60 Hz 230 VAC 60 Hz	1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.8 (33)	4.3 (38)	6.0 (53)	7.2 (63)	8.7 (76)	12.0 (106)	14.4 (127)	17.0 (150)	20.4 (180)	22.7 (200)	27.2 (240)	34.0 (300)	40 (350)	–	–	–

●V Series Reversible Motors

◇Single-Phase 110/115 VAC

Unit = N·m (lb-in)

Model	Gear Ratio	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
Combination Type	Speed																					
VSR206A2-□U	1200 r/min	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
	90 r/min	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
VSR315A2-□U	1200 r/min	0.56 (4.9)	0.68 (6.0)	0.84 (7.4)	1.0 (8.8)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.2 (28)	3.9 (34)	5.4 (47)	6.5 (57)	8.1 (71)	9.7 (85)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	0.38 (3.3)	0.46 (4.0)	0.57 (5.0)	0.69 (6.1)	0.96 (8.4)	1.1 (9.7)	1.4 (12.3)	1.9 (16.8)	2.2 (19.4)	2.6 (23)	3.7 (32)	4.4 (38)	5.5 (48)	6.6 (58)	7.3 (64)	8.8 (77)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
VSR425A2-□U	1200 r/min	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.3 (20)	2.8 (24)	3.3 (29)	4.6 (40)	5.3 (46)	6.3 (55)	8.8 (77)	10.6 (93)	13.2 (116)	15.9 (140)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
	90 r/min	0.50 (4.4)	0.59 (5.2)	0.74 (6.5)	0.89 (7.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.5 (22)	2.8 (24)	3.4 (30)	4.7 (41)	5.7 (50)	7.1 (62)	8.5 (75)	9.5 (84)	11.4 (100)	13.4 (118)	16 (141)	16 (141)	16 (141)	16 (141)
VSR540A2-□U	1200 r/min	1.4 (12.3)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.6 (31)	4.3 (38)	5.2 (46)	6.9 (61)	8.3 (73)	9.9 (87)	13.8 (122)	16.5 (146)	20.6 (182)	24.8 (210)	27.5 (240)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	0.70 (6.1)	0.84 (7.4)	1.0 (8.8)	1.3 (11.5)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	3.3 (29)	4.0 (35)	4.8 (42)	6.7 (59)	8.0 (70)	10.0 (88)	12.0 (106)	13.3 (117)	15.1 (133)	18.8 (166)	22.6 (200)	30 (260)	30 (260)	–
VSR560A-□U	1200 r/min	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.5 (48)	6.6 (58)	7.9 (69)	10.5 (92)	12.6 (111)	15.2 (134)	21.1 (186)	25.3 (223)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	3.0 (26)	3.6 (31)	4.4 (38)	5.8 (51)	7.0 (61)	8.4 (74)	11.6 (102)	13.9 (123)	17.4 (153)	20.9 (184)	23.2 (200)	26.2 (230)	30 (260)	30 (260)	30 (260)	30 (260)	–
VSR590A-□U	1200 r/min	3.3 (29)	3.9 (34)	4.9 (43)	5.9 (52)	8.2 (72)	9.9 (87)	11.3 (100)	15.7 (138)	18.8 (166)	22.6 (200)	31.4 (270)	37.7 (330)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
	90 r/min	1.4 (12.3)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.6 (31)	4.3 (38)	5.0 (44)	6.9 (61)	8.3 (73)	9.9 (87)	13.8 (122)	16.5 (146)	19.4 (171)	23.3 (200)	25.9 (220)	31.1 (270)	38.9 (340)	40 (350)	–	–	–

◇Single-Phase 220/230 VAC

Unit = N·m (lb-in)

Model	Gear Ratio		5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360
Combination Type	Speed																						
VSR206C2-□E	1200 r/min	220 VAC 50 Hz	0.19 (1.68)	0.23 (2.03)	0.28 (2.4)	0.34 (3.0)	0.47 (4.1)	0.57 (5.0)	0.68 (6.0)	0.95 (8.4)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	3.6 (31)	4.3 (38)	5.1 (45)	6 (53)	6 (53)	6 (53)	6 (53)
		230 VAC 50 Hz	0.21 (1.85)	0.25 (2.2)	0.31 (2.7)	0.37 (3.2)	0.52 (4.6)	0.62 (5.4)	0.75 (6.6)	1.0 (8.8)	1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.0 (35)	4.7 (41)	5.6 (49)	6 (53)	6 (53)	6 (53)	6 (53)
		60 Hz	0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
	90 r/min		0.23 (2.0)	0.27 (2.3)	0.34 (3.0)	0.41 (3.6)	0.56 (4.9)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.3 (11.5)	1.5 (13.2)	2.2 (19.4)	2.6 (23)	3.2 (28)	3.9 (34)	4.3 (38)	5.2 (46)	6 (53)	6 (53)	6 (53)	6 (53)	6 (53)
VSR315C2-□E	1200 r/min		0.56 (4.9)	0.68 (6.0)	0.84 (7.4)	1.0 (8.8)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.2 (28)	3.9 (34)	5.4 (47)	6.5 (57)	8.1 (71)	9.7 (85)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min		0.39 (3.4)	0.47 (4.1)	0.59 (5.2)	0.70 (6.1)	0.98 (8.6)	1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.2 (19.4)	2.7 (23)	3.7 (32)	4.5 (39)	5.6 (49)	6.7 (59)	7.5 (66)	9.0 (79)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
VSR425C2-□E	1200 r/min		0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.3 (20)	2.8 (24)	3.3 (29)	4.6 (40)	5.3 (46)	6.3 (55)	8.8 (77)	10.6 (93)	13.2 (116)	15.9 (140)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
	90 r/min	50 Hz	0.52 (4.6)	0.62 (5.4)	0.78 (6.9)	0.93 (8.2)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.6 (23)	3.0 (26)	3.6 (31)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	9.9 (87)	11.9 (105)	14.0 (123)	16 (141)	16 (141)	16 (141)	16 (141)
		60 Hz	0.50 (4.4)	0.59 (5.2)	0.74 (6.5)	0.89 (7.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.5 (22)	2.8 (24)	3.4 (30)	4.7 (41)	5.7 (50)	7.1 (62)	8.5 (75)	9.5 (84)	11.4 (100)	13.4 (118)	16 (141)	16 (141)	16 (141)	16 (141)
VSR540C2-□E	1200 r/min		1.4 (12.3)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.6 (31)	4.3 (38)	5.2 (46)	6.9 (61)	8.3 (73)	9.9 (87)	13.8 (122)	16.5 (146)	20.6 (182)	24.8 (210)	27.5 (240)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min	220 VAC 50 Hz	0.81 (7.1)	0.97 (8.5)	1.2 (10.6)	1.5 (13.2)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.9 (34)	4.6 (40)	5.6 (49)	7.7 (68)	9.3 (82)	11.6 (102)	13.9 (123)	15.5 (137)	17.5 (154)	21.9 (193)	26.2 (230)	30 (260)	30 (260)	–
		220 VAC 60 Hz 230 VAC	0.77 (6.8)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.7 (32)	4.4 (38)	5.3 (46)	7.3 (64)	8.8 (77)	11.0 (97)	13.2 (116)	14.6 (129)	16.5 (146)	20.7 (183)	24.8 (210)	30 (260)	30 (260)	–
VSR560C-□E	1200 r/min		2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.5 (48)	6.6 (58)	7.9 (69)	10.5 (92)	12.6 (111)	15.2 (134)	21.1 (186)	25.3 (220)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	–
	90 r/min		1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.8 (33)	4.5 (39)	6.0 (53)	7.2 (63)	8.7 (76)	12.0 (106)	14.4 (127)	18.1 (160)	21.7 (192)	24.1 (210)	27.2 (240)	30 (260)	30 (260)	30 (260)	30 (260)	–
VSR590C-□E	1200 r/min	220 VAC 50 Hz	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	7.5 (66)	9.0 (79)	10.4 (92)	14.4 (127)	17.3 (153)	20.7 (183)	28.8 (250)	34.6 (300)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
		220 VAC 60 Hz 230 VAC	3.3 (29)	3.9 (34)	4.9 (43)	5.9 (52)	8.2 (72)	9.9 (87)	11.3 (100)	15.7 (138)	18.8 (166)	22.6 (200)	31.4 (270)	37.7 (330)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	–	–	–
	90 r/min	220 VAC	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.9 (25)	4.1 (36)	4.9 (43)	5.6 (49)	7.7 (68)	9.3 (82)	11.1 (98)	15.5 (137)	18.6 (164)	21.9 (193)	26.2 (230)	29.2 (250)	35.0 (300)	40 (350)	40 (350)	–	–	–
		230 VAC	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.8 (24)	3.9 (34)	4.7 (41)	5.4 (47)	7.5 (66)	9.0 (79)	10.8 (95)	15.1 (133)	18.1 (160)	21.3 (188)	25.5 (220)	28.4 (250)	34.0 (300)	40 (350)	40 (350)	–	–	–

●World K Series Induction Motors

◇Single-Phase 110/115 VAC

Unit = N·m (lb-in)

Model	Gear Ratio	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
Motor/Gearhead	Speed																				
2IK6RGN-AW2U /2GN□SA	1200 r/min	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
	90 r/min	0.083 (0.73)	0.099 (0.87)	0.14 (1.23)	0.17 (1.50)	0.21 (1.85)	0.25 (2.2)	0.34 (3.0)	0.41 (3.6)	0.50 (4.4)	0.62 (5.4)	0.74 (6.5)	0.89 (7.8)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.2 (19.4)	2.7 (23)	3 (26)	3 (26)
3IK15RGN-AW2U /3GN□SA	1200 r/min	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.76 (6.7)	0.91 (8.0)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.7 (23)	3.3 (29)	4.1 (36)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
	90 r/min	0.10 (0.88)	0.12 (1.06)	0.17 (1.50)	0.20 (1.77)	0.26 (2.3)	0.31 (2.7)	0.43 (3.8)	0.51 (4.5)	0.61 (5.3)	0.77 (6.8)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	2.8 (24)	3.3 (29)	4.2 (37)	5 (44)
4IK25RGN-AW2U /4GN□SA	1200 r/min	0.45 (3.9)	0.54 (4.7)	0.75 (6.6)	0.90 (7.9)	1.1 (9.7)	1.3 (11.5)	1.9 (16.8)	2.2 (19.4)	2.7 (23)	3.4 (30)	4.1 (36)	4.9 (43)	6.1 (53)	7.3 (64)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	90 r/min	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3.0 (26)	3.3 (29)	4.0 (35)	5.0 (44)	5.9 (52)
5IK40RGN-AW2U /5GN□SA	1200 r/min	0.55 (4.8)	0.66 (5.8)	0.91 (8.0)	1.1 (9.7)	1.4 (12.3)	1.6 (14.1)	2.3 (20)	2.7 (23)	3.3 (29)	4.1 (36)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	0.16 (1.41)	0.20 (1.77)	0.27 (2.3)	0.33 (2.9)	0.41 (3.6)	0.49 (4.3)	0.68 (6.0)	0.81 (7.1)	0.98 (8.6)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	4.0 (35)	4.4 (38)	5.3 (46)	6.6 (58)	8.0 (70)
5IK60RGU-AWU /5GU□KA	1200 r/min	1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	6.4 (56)	8.1 (71)	9.7 (85)	11.6 (102)	16.2 (143)	19.4 (171)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	90 r/min	0.51 (4.5)	0.61 (5.3)	0.85 (7.5)	1.0 (8.8)	1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	5.0 (44)	6.9 (61)	8.3 (73)	9.3 (82)	11.2 (99)	12.4 (109)	14.9 (131)	18.6 (164)	20 (177)

◇Single-Phase 220/230 VAC

Unit = N·m (lb-in)

Model / Motor/Gearhead	Gear Ratio / Speed		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
2IK6RGN-CW2E /2GN□SA	1200 r/min	220 VAC 50 Hz	0.087 (0.77)	0.10 (0.88)	0.15 (1.3)	0.17 (1.5)	0.22 (1.9)	0.26 (2.3)	0.36 (3.1)	0.44 (3.8)	0.52 (4.6)	0.66 (5.8)	0.79 (6.9)	0.95 (8.4)	1.2 (10.6)	1.4 (12.3)	1.8 (15.9)	2.1 (18.5)	2.4 (21)	2.9 (25)	3 (26)	3 (26)
		230 VAC 50 Hz	0.097 (0.85)	0.12 (1.06)	0.16 (1.41)	0.19 (1.68)	0.24 (2.1)	0.29 (2.5)	0.41 (3.6)	0.49 (4.3)	0.58 (5.1)	0.73 (6.4)	0.88 (7.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.6 (23)	3 (26)	3 (26)	3 (26)
		60 Hz	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
	90 r/min		0.08 (0.70)	0.096 (0.84)	0.13 (1.15)	0.16 (1.41)	0.20 (1.77)	0.24 (2.1)	0.33 (2.9)	0.40 (3.5)	0.48 (4.2)	0.60 (5.3)	0.72 (6.3)	0.87 (7.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.2 (19.4)	2.6 (23)	3 (26)	3 (26)
3IK15RGN-CW2E /3GN□SA	1200 r/min	220 VAC 50 Hz	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.53 (4.6)	0.67 (5.9)	0.80 (7.0)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.6 (31)	4.4 (38)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
		230 VAC 50 Hz	0.28 (2.4)	0.34 (3.0)	0.47 (4.1)	0.56 (4.9)	0.70 (6.1)	0.84 (7.4)	1.2 (10.6)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	3.0 (26)	3.8 (33)	4.6 (40)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
		60 Hz	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.76 (6.7)	0.91 (8.0)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.7 (23)	3.3 (29)	4.1 (36)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
	90 r/min		0.092 (0.81)	0.11 (0.97)	0.15 (1.32)	0.18 (1.59)	0.23 (2.0)	0.28 (2.4)	0.38 (3.3)	0.46 (4.0)	0.55 (4.8)	0.69 (6.1)	0.83 (7.3)	1.0 (8.8)	1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	2.5 (22)	3.0 (26)	3.8 (33)	4.5 (39)
4IK25RGN-CW2E /4GN□SA	1200 r/min	50 Hz	0.50 (4.4)	0.60 (5.3)	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	2.1 (18.5)	2.5 (22)	3.0 (26)	3.7 (32)	4.5 (39)	5.4 (47)	6.8 (60)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
		220 VAC 60 Hz	0.39 (3.4)	0.47 (4.1)	0.65 (5.7)	0.78 (6.9)	0.97 (8.5)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	2.9 (25)	3.5 (30)	4.2 (37)	5.3 (46)	6.3 (55)	7.9 (69)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
		230 VAC 60 Hz	0.36 (3.1)	0.44 (3.8)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	3.9 (34)	5.0 (44)	5.9 (52)	7.4 (65)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	90 r/min		0.097 (0.85)	0.12 (1.06)	0.16 (1.41)	0.19 (1.68)	0.24 (2.1)	0.29 (2.5)	0.41 (3.6)	0.49 (4.3)	0.58 (5.1)	0.73 (6.4)	0.88 (7.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.6 (23)	3.2 (28)	4.0 (35)	4.8 (42)
5IK40RGN-CW2E /5GN□SA	1200 r/min	220 VAC 50 Hz	0.73 (6.4)	0.87 (7.7)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	3.0 (26)	3.6 (31)	4.4 (38)	5.5 (48)	6.6 (58)	7.9 (69)	9.9 (87)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		220 VAC 60 Hz	0.68 (6.0)	0.82 (7.2)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.4 (30)	4.1 (36)	5.1 (45)	6.1 (53)	7.4 (65)	9.2 (81)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		230 VAC 50 Hz	0.78 (6.9)	0.93 (8.2)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.9 (34)	4.7 (41)	5.8 (51)	7.0 (61)	8.4 (74)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		230 VAC 60 Hz	0.63 (5.5)	0.76 (6.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.6 (23)	3.2 (28)	3.8 (33)	4.7 (41)	5.7 (50)	6.8 (60)	8.6 (76)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	220 VAC	0.18 (1.59)	0.22 (1.94)	0.30 (2.6)	0.36 (3.1)	0.46 (4.0)	0.55 (4.8)	0.76 (6.7)	0.91 (8.0)	1.1 (9.7)	1.4 (12.3)	1.6 (14.1)	2.0 (17.7)	2.5 (22)	3.0 (26)	3.7 (32)	4.5 (39)	5.0 (44)	5.9 (52)	7.4 (65)	8.9 (78)
		230 VAC	0.17 (1.50)	0.20 (1.77)	0.28 (2.4)	0.34 (3.0)	0.43 (3.8)	0.51 (4.5)	0.71 (6.2)	0.85 (7.5)	1.0 (8.8)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	4.6 (40)	5.5 (48)	6.9 (61)	8.3 (73)
5IK60RGU-CWE /5GU□KA	1200 r/min	50 Hz	1.1 (9.7)	1.3 (11.5)	1.9 (16.8)	2.2 (19.4)	2.8 (24)	3.4 (30)	4.2 (37)	5.0 (44)	6.0 (53)	7.6 (67)	9.1 (80)	10.9 (96)	15.2 (134)	18.2 (161)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
		60 Hz	1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	6.4 (56)	8.1 (71)	9.7 (85)	11.6 (102)	16.2 (143)	19.4 (171)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	90 r/min	220 VAC 50 Hz	0.49 (4.3)	0.58 (5.1)	0.81 (7.1)	0.97 (8.5)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	4.8 (42)	6.6 (58)	7.9 (69)	8.9 (78)	10.6 (93)	11.8 (104)	14.2 (125)	17.7 (156)	20 (177)
		220 VAC 60 Hz	0.52 (4.6)	0.63 (5.5)	0.87 (7.7)	1.0 (8.8)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.8 (24)	3.5 (30)	4.3 (38)	5.1 (45)	7.1 (62)	8.5 (75)	9.5 (84)	11.4 (100)	12.7 (112)	15.2 (134)	19.0 (168)	20 (177)
		230 VAC 50 Hz	0.41 (3.6)	0.50 (4.4)	0.69 (6.1)	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.2 (19.4)	2.8 (24)	3.4 (30)	4.0 (35)	5.6 (49)	6.7 (59)	7.5 (66)	9.0 (79)	10.0 (88)	12.0 (106)	15.0 (132)	18.1 (160)
		230 VAC 60 Hz	0.44 (3.8)	0.52 (4.6)	0.73 (6.4)	0.87 (7.6)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.3 (38)	5.9 (52)	7.1 (62)	8.0 (70)	9.6 (84)	10.6 (93)	12.7 (112)	15.9 (140)	19.1 (169)

●World **K** Series Reversible Motors

◇Single-Phase 110/115 VAC

Unit = N·m (lb-in)

Model / Motor/Gearhead	Gear Ratio / Speed	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
2RK6RGN-AW2U /2GN□SA	1200 r/min	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
	90 r/min	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
3RK15RGN-AW2U /3GN□SA	1200 r/min	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.76 (6.7)	0.91 (8.0)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.7 (23)	3.3 (29)	4.1 (36)	5.0 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
	90 r/min	0.21 (1.85)	0.25 (2.2)	0.34 (3.0)	0.41 (3.6)	0.52 (4.6)	0.62 (5.4)	0.86 (7.6)	1.0 (8.8)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.2 (19.4)	2.8 (24)	3.4 (30)	4.2 (37)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
4RK25RGN-AW2U /4GN□SA	1200 r/min	0.50 (4.4)	0.60 (5.3)	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	2.1 (18.5)	2.5 (22)	3.0 (26)	3.7 (32)	4.5 (39)	5.4 (47)	6.8 (60)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	90 r/min	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.53 (4.6)	0.67 (5.9)	0.80 (7.0)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.6 (31)	4.4 (38)	5.4 (47)	6.5 (57)	7.3 (64)	8 (70)	8 (70)	8 (70)
5RK40RGN-AW2U /5GN□SA	1200 r/min	0.78 (6.9)	0.93 (8.2)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.9 (34)	4.7 (41)	5.8 (51)	7.0 (61)	8.4 (74)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	0.38 (3.3)	0.45 (3.9)	0.63 (5.5)	0.75 (6.6)	0.94 (8.3)	1.1 (9.7)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.4 (30)	4.1 (36)	5.1 (45)	6.1 (53)	7.7 (68)	9.2 (81)	10 (88)	10 (88)	10 (88)	10 (88)
5RK60RGU-AWU /5GU□KA	1200 r/min	1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	6.4 (56)	8.1 (71)	9.7 (85)	11.6 (102)	16.2 (143)	19.4 (171)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	90 r/min	0.66 (5.8)	0.79 (6.9)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.5 (22)	3.0 (26)	3.5 (30)	4.5 (39)	5.3 (46)	6.4 (56)	8.9 (78)	10.7 (94)	11.9 (105)	14.3 (126)	15.9 (140)	19.1 (169)	20 (177)	20 (177)

◇Single-Phase 220/230 VAC

Unit = N·m (lb-in)

Model / Motor/Gearhead	Gear Ratio / Speed		3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
2RK6RGN-CW2E /2GN□SA	1200 r/min	220 VAC 50 Hz	0.10 (0.88)	0.12 (1.06)	0.17 (1.50)	0.20 (1.77)	0.26 (2.3)	0.31 (2.7)	0.43 (3.8)	0.51 (4.5)	0.61 (5.3)	0.77 (6.8)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	2.8 (24)	3 (26)	3 (26)	3 (26)
		230 VAC 50 Hz	0.11 (0.97)	0.13 (1.15)	0.19 (1.68)	0.22 (1.94)	0.28 (2.4)	0.34 (3.0)	0.47 (4.1)	0.56 (4.9)	0.67 (5.9)	0.84 (7.4)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.7 (23)	3 (26)	3 (26)	3 (26)	3 (26)
		60 Hz	0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
	90 r/min		0.12 (1.06)	0.15 (1.32)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.3 (11.5)	1.7 (15.0)	2.0 (17.7)	2.5 (22)	3 (26)	3 (26)	3 (26)	3 (26)	3 (26)
3RK15RGN-CW2E /3GN□SA	1200 r/min		0.30 (2.6)	0.36 (3.1)	0.51 (4.5)	0.61 (5.3)	0.76 (6.7)	0.91 (8.0)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.7 (23)	3.3 (29)	4.1 (36)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
	90 r/min		0.21 (1.8)	0.25 (2.2)	0.35 (3.0)	0.42 (3.7)	0.53 (4.6)	0.63 (5.5)	0.88 (7.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	2.9 (25)	3.4 (30)	4.3 (38)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
4RK25RGN-CW2E /4GN□SA	1200 r/min		0.50 (4.4)	0.60 (5.3)	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	2.1 (18.5)	2.5 (22)	3.0 (26)	3.7 (32)	4.5 (39)	5.4 (47)	6.8 (60)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	90 r/min	50 Hz	0.28 (2.4)	0.34 (3.0)	0.47 (4.1)	0.56 (4.9)	0.70 (6.1)	0.84 (7.4)	1.2 (10.6)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	3.0 (26)	3.8 (33)	4.6 (40)	5.7 (50)	6.8 (60)	7.6 (67)	8 (70)	8 (70)	8 (70)
		60 Hz	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.53 (4.6)	0.67 (5.9)	0.80 (7.0)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.6 (31)	4.4 (38)	5.4 (47)	6.5 (57)	7.3 (64)	8 (70)	8 (70)	8 (70)
5RK40RGN-CW2E /5GN□SA	1200 r/min		0.78 (6.9)	0.93 (8.2)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.9 (34)	4.7 (41)	5.8 (51)	7.0 (61)	8.4 (74)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	90 r/min	220 VAC 50 Hz	0.44 (3.8)	0.52 (4.6)	0.73 (6.4)	0.87 (7.6)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.3 (29)	3.9 (34)	4.7 (41)	5.9 (52)	7.1 (62)	8.9 (78)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
		220 VAC 60 Hz 230 VAC	0.41 (3.6)	0.50 (4.4)	0.69 (6.1)	0.83 (7.3)	1.0 (8.8)	1.2 (10.6)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	3.1 (27)	3.7 (32)	4.5 (39)	5.6 (49)	6.7 (59)	8.4 (74)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
5RK60RGU-CWE /5GU□KA	1200 r/min		1.2 (10.6)	1.4 (12.3)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.5 (39)	5.4 (47)	6.4 (56)	8.1 (71)	9.7 (85)	11.6 (102)	16.2 (143)	19.4 (171)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	90 r/min		0.68 (6.0)	0.82 (7.2)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.0 (17.7)	2.6 (23)	3.1 (27)	3.7 (32)	4.6 (40)	5.5 (48)	6.7 (59)	9.2 (81)	11.1 (98)	12.4 (109)	14.9 (131)	16.5 (146)	19.8 (175)	20 (177)	20 (177)

Permissible Overhung Load and Permissible Thrust Load

Motor (Round shaft type) ➜ Page 31
Gearhead ➜ Page 31

Permissible Load Inertia of Gearhead: J

➜ Page 32

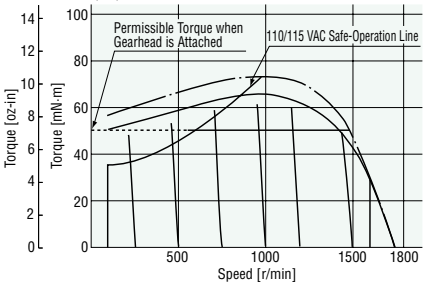
Speed – Torque Characteristics

Enter the gear ratio in the box (□) within the model name of the **V** Series combination type. Enter **GV**, **GVH** or **GVR** in the box (□) within the model name of the **V** Series pinion shaft type. The values for each specification of the **V** Series apply to the motor only.

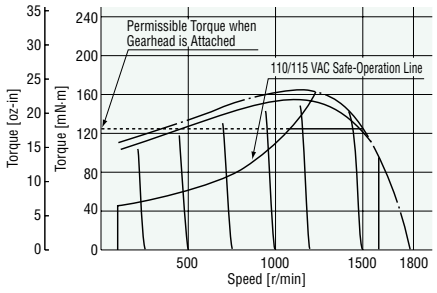
●Induction Motors

◇Single-Phase 110/115 VAC ——110 VAC 60 Hz —·—·115 VAC 60 Hz

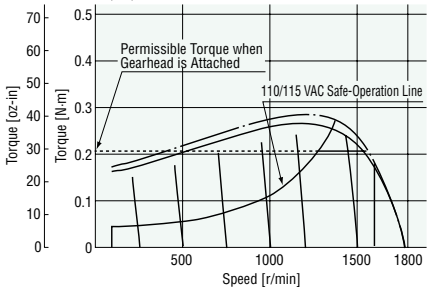
VSI206A2-□U/ES01
2IK6RGN(A)-AW2U/ES01



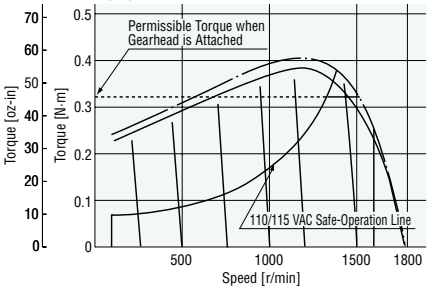
VSI315A2-□U/ES01
3IK15RGN(A)-AW2U/ES01



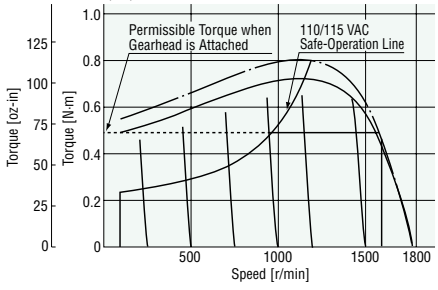
VSI425A2-□U/ES01
4IK25RGN(A)-AW2U/ES01



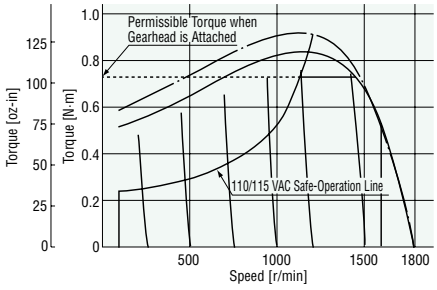
VSI540A2-□U/ES01
5IK40RGN(A)-AW2U/ES01



VSI560A-□U/ES01
5IK60RGU(A)-AWU/ES01

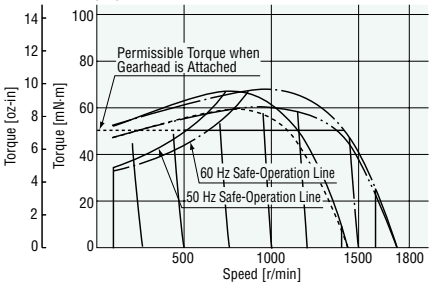


VSI590A-□U/ES01

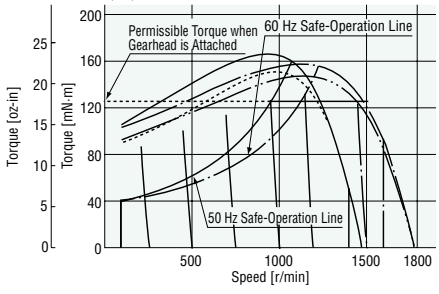


◇Single-Phase 220/230 VAC ·····220 VAC 50 Hz ——230 VAC 50 Hz —·—220 VAC 60 Hz —·—·230 VAC 60 Hz

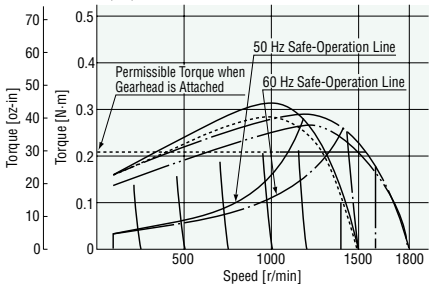
VSI206C2-□E/ES02
2IK6RGN(A)-CW2E/ES02



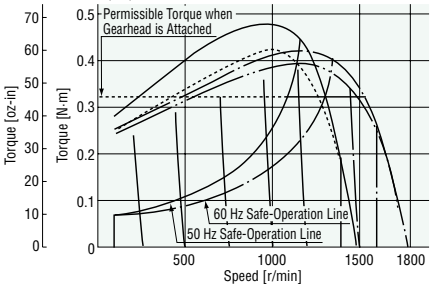
VSI315C2-□E/ES02
3IK15RGN(A)-CW2E/ES02



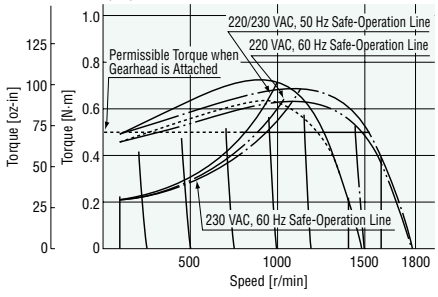
VSI425C2-□E/ES02
4IK25RGN(A)-CW2E/ES02



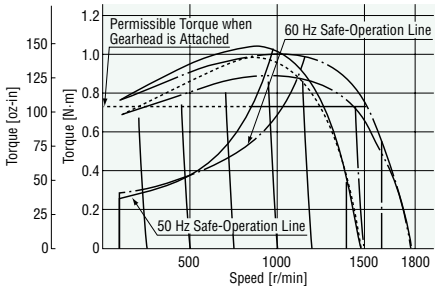
VSI540C2-□E/ES02
5IK40RGN(A)-CW2E/ES02



VSI560C-□E/ES02
5IK60RGU(A)-CWE/ES02



VSI590C-□E/ES02

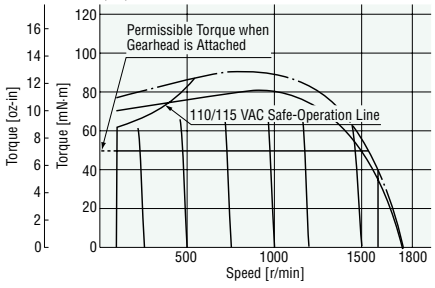


●Reversible Motors

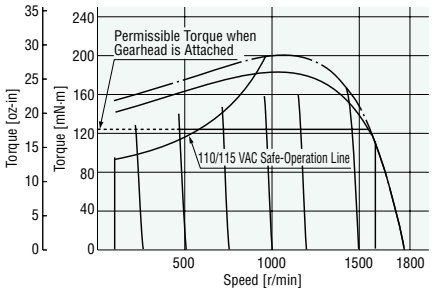
◇Single-Phase 110/115 VAC

——110 VAC 60 Hz —·—·115 VAC 60 Hz

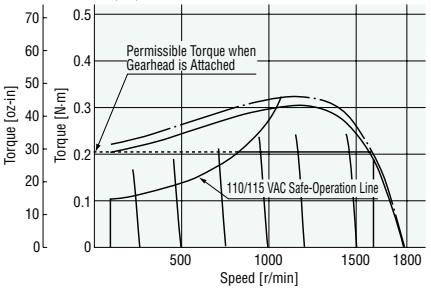
VSR206A2-□U/ES01
2RK6RGN(A)-AW2U/ES01



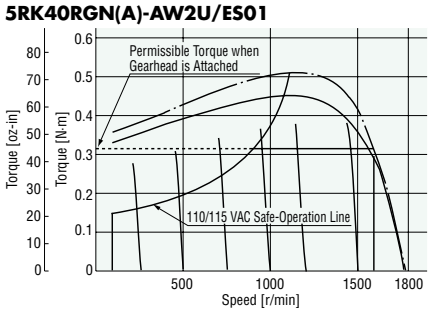
VSR315A2-□U/ES01
3RK15RGN(A)-AW2U/ES01



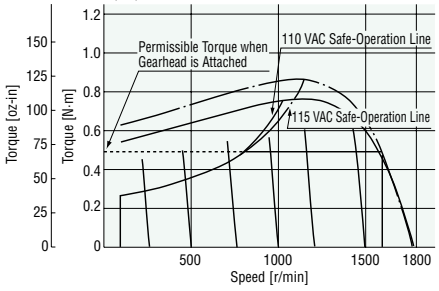
VSR425A2-□U/ES01
4RK25RGN(A)-AW2U/ES01



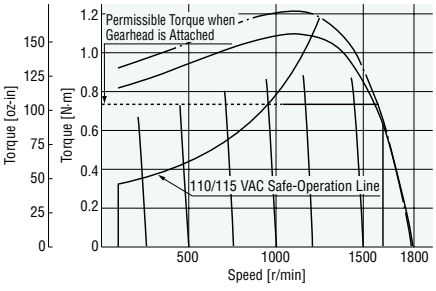
VSR540A2-□U/ES01
5RK40RGRN(A)-AW2U/ES01



VSR560A-□U/ES01
5RK60RGU(A)-AWU/ES01



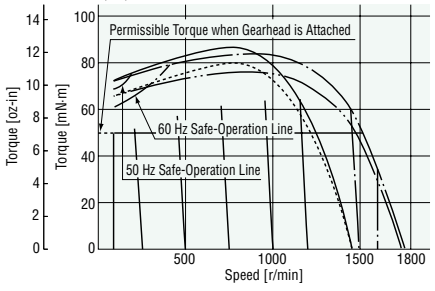
VSR590A-□U/ES01



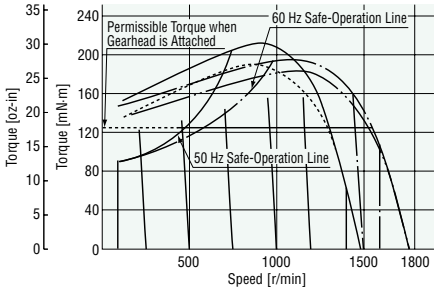
◇Single-Phase 220/230 VAC

·····220 VAC 50 Hz ——230 VAC 50 Hz —·—220 VAC 60 Hz —·—·230 VAC 60 Hz

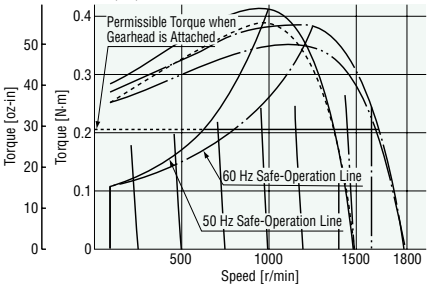
VSR206C2-□E/ES02
2RK6RGN(A)-CW2E/ES02



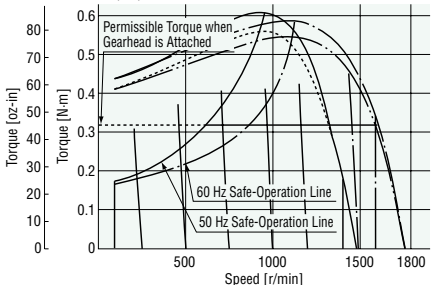
VSR315C2-□E/ES02
3RK15RGN(A)-CW2E/ES02



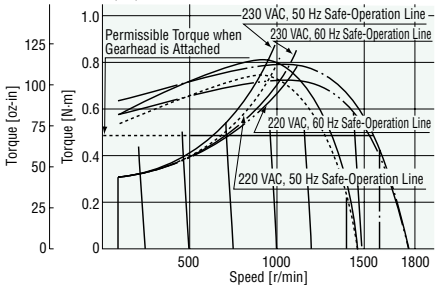
VSR425C2-□E/ES02
4RK25RGN(A)-CW2E/ES02



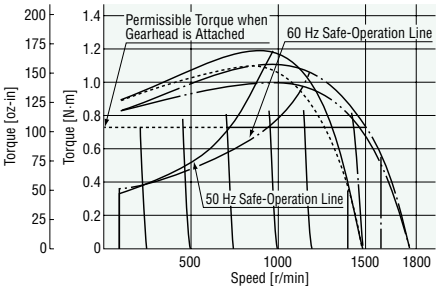
VSR540C2-□E/ES02
5RK40RGN(A)-CW2E/ES02



VSR560C-□E/ES02
5RK60RGU(A)-CWE/ES02



VSR590C-□E/ES02



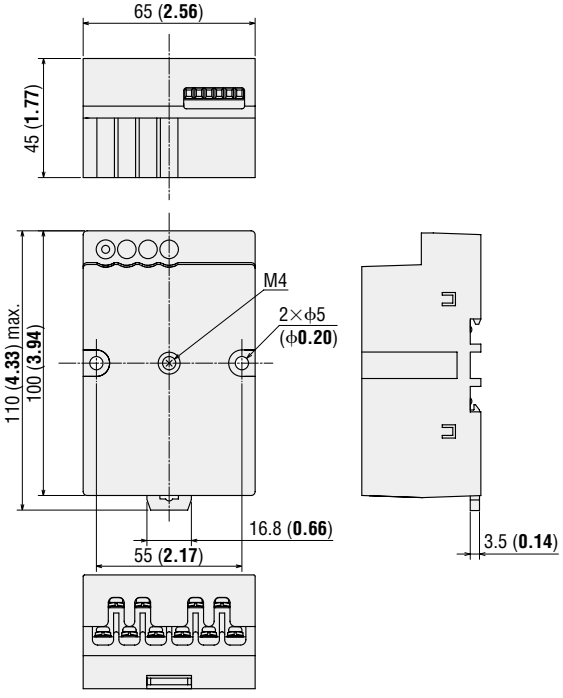
Dimensions Unit = mm (in.)

Speed Controller

ESD1, **ESD2**

Mass: 0.18 kg (0.4 lb.)

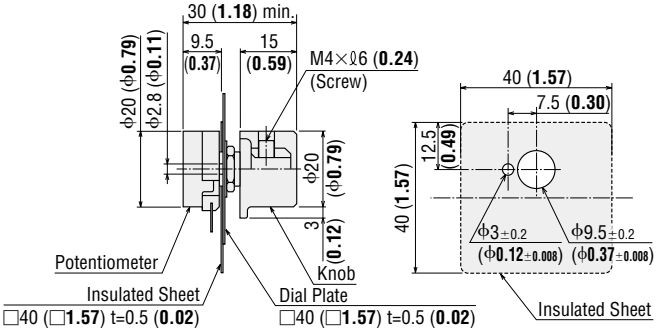
DXF A394



◇External Speed Potentiometer (Included with the speed controller)

PAVR-20KZ

Mass: 20 g (0.71 oz.)



Recommended thickness of a mounting plate is a maximum 4.5 mm (**0.18** in.).

V Series

●Mounting screws are included with the combination type.

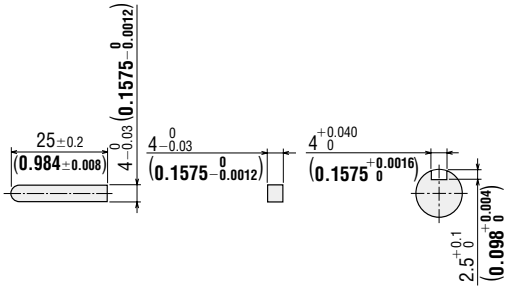
◇Motor/Gearhead (Combination type)

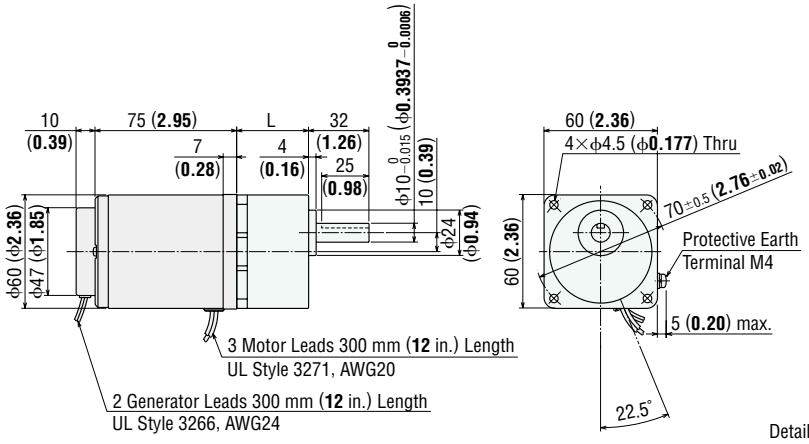
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI206A2-□U	VSI206A2-GV	GV2G□	**5**~**25**	34 (1.34)	A500A
VSI206C2-□E	VSI206C2-GV		**30**~**120**	38 (1.50)	A500B
VSR206A2-□U	VSR206A2-GV		**150**~**360**	43 (1.69)	A500C
VSR206C2-□E	VSR206C2-GV				

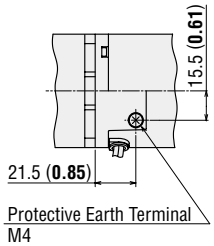
●Enter the gear ratio in the box (□) within the model name.

Mass: 1.3 kg (2.9 lb.) (Including gearhead)

◇Key and Key Slot (Included)







Detail Drawing of Protective Earth Terminal

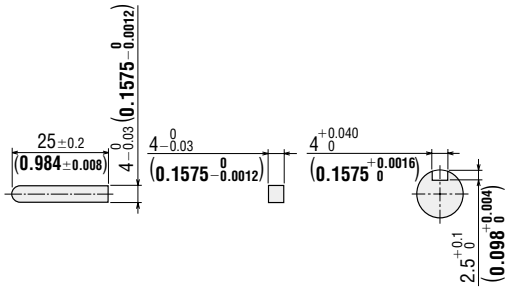
◇Motor/Gearhead (Combination type)

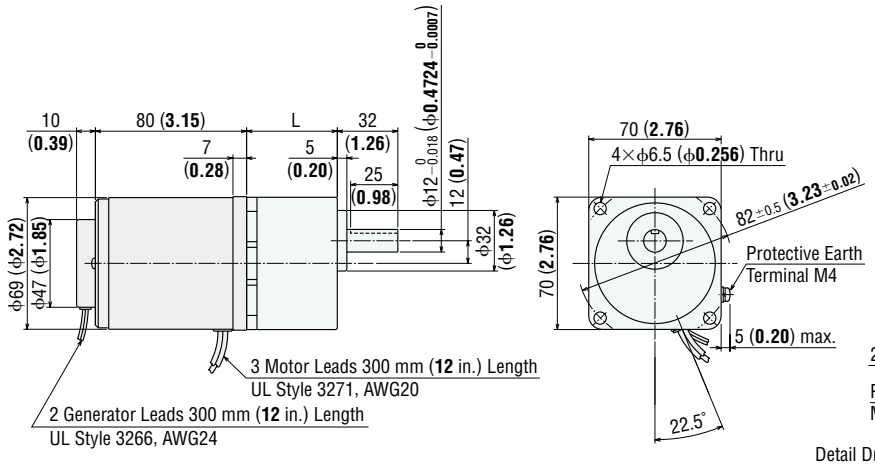
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI315A2-□U	VSI315A2-GV	GV3G□	**5**~**25**	38 (1.50)	A501A
VSI315C2-□E	VSI315C2-GV		**30**~**120**	43 (1.69)	A501B
VSR315A2-□U	VSR315A2-GV				
VSR315C2-□E	VSR315C2-GV		**150**~**360**	48 (1.89)	A501C

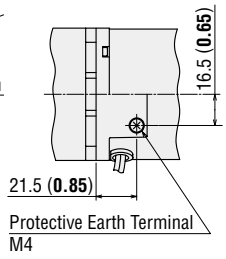
● Enter the gear ratio in the box (□) within the model name.

Mass: 1.8 kg (4.0 lb.) (Including gearhead)

◇Key and Key Slot (Included)







Detail Drawing of Protective Earth Terminal

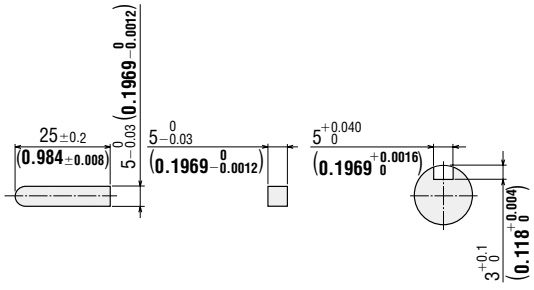
◇Motor/Gearhead (Combination type)

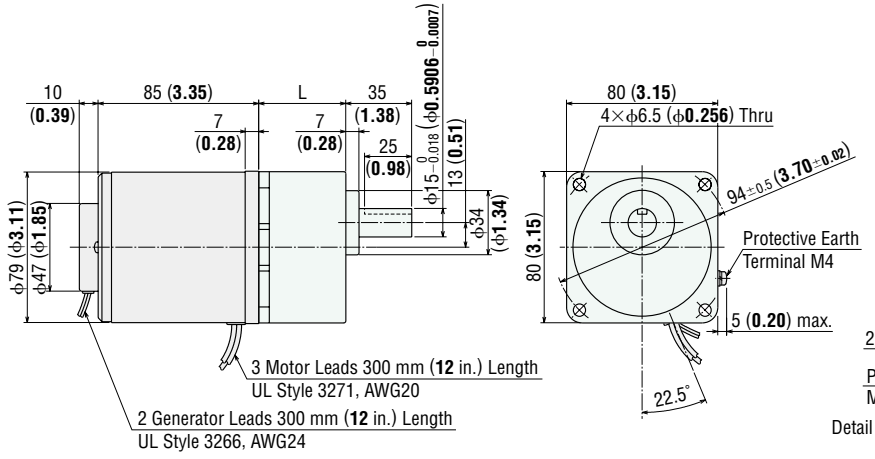
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI425A2-□U	VSI425A2-GV	GV4G□	**5**~**25**	41 (1.61)	A502A
VSI425C2-□E	VSI425C2-GV		**30**~**120**	46 (1.81)	A502B
VSR425A2-□U	VSR425A2-GV				
VSR425C2-□E	VSR425C2-GV		**150**~**360**	51 (2.01)	A502C

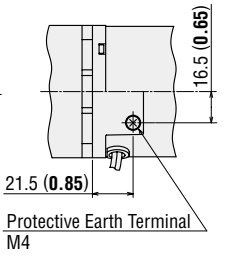
● Enter the gear ratio in the box (□) within the model name.

Mass: 2.6 kg (5.7 lb.) (Including gearhead)

◇Key and Key Slot (Included)







Detail Drawing of Protective Earth Terminal

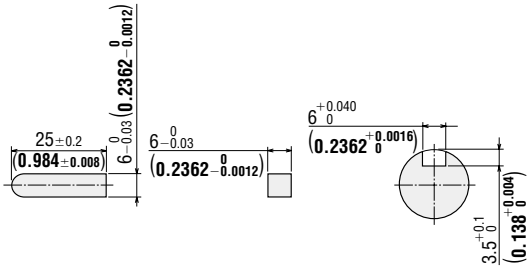
◇Motor/Gearhead (Combination type)

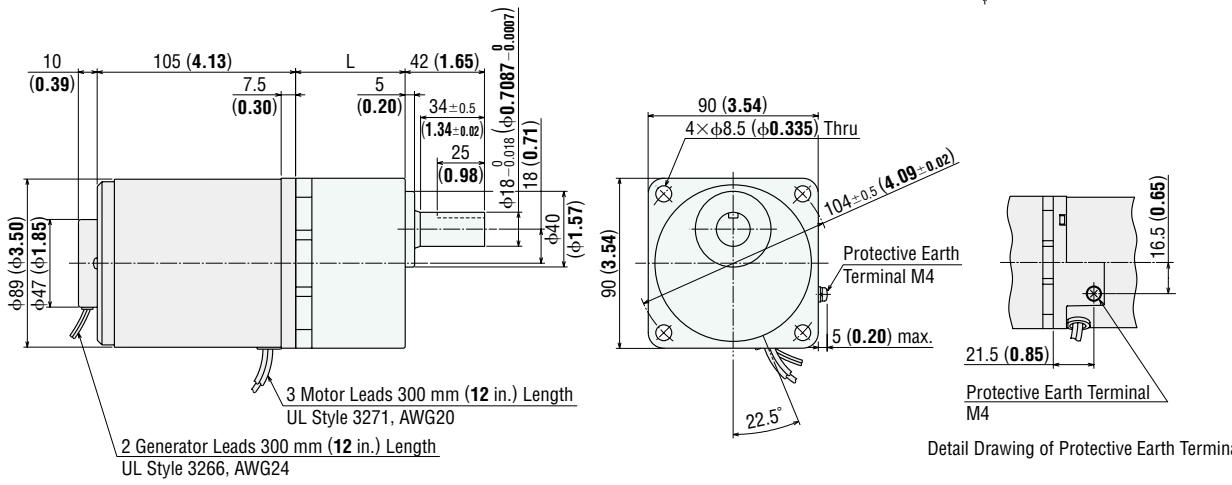
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI540A2-□U	VSI540A2-GVH	GVH5G□	**5**~**18**	45 (1.77)	A503A
VSI540C2-□E	VSI540C2-GVH		**25**~**100**	58 (2.28)	A503B
VSR540A2-□U	VSR540A2-GVH				
VSR540C2-□E	VSR540C2-GVH		**120**~**300**	64 (2.52)	A503C

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

Mass: 4.1 kg (9.0 lb.) (Including gearhead)

◇Key and Key Slot (Included)





Detail Drawing of Protective Earth Terminal

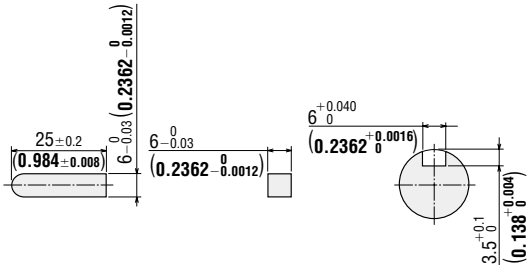
◇Motor/Gearhead (Combination type)

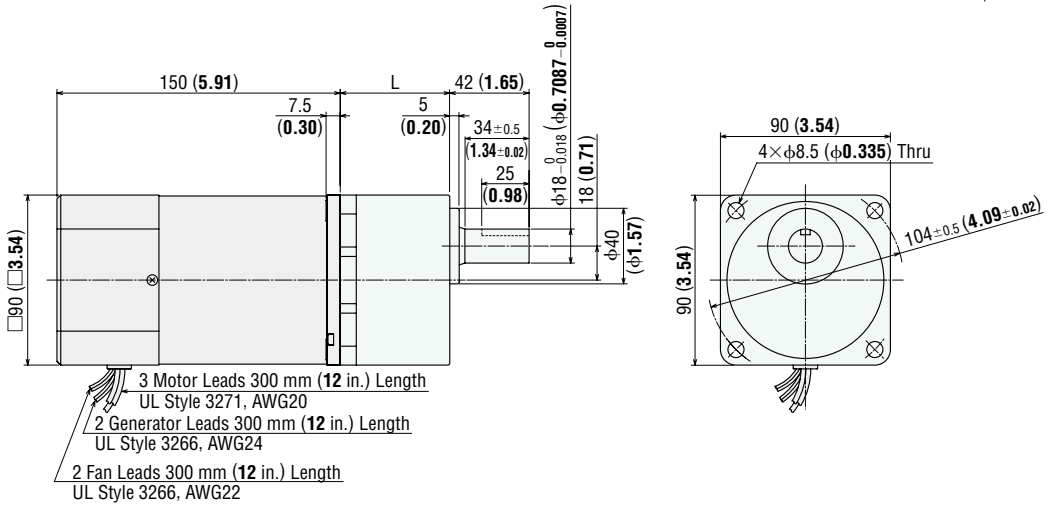
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI560A-□U	VSI560A-GVH	GVH5G□	**5**~**18**	45 (1.77)	A395A
VSI560C-□E	VSI560C-GVH		**25**~**100**	58 (2.28)	A395B
VSR560A-□U	VSR560A-GVH				
VSR560C-□E	VSR560C-GVH		**120**~**300**	64 (2.52)	A395C

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

Mass: 4.3 kg (9.5 lb.) (Including gearhead)

◇Key and Key Slot (Included)





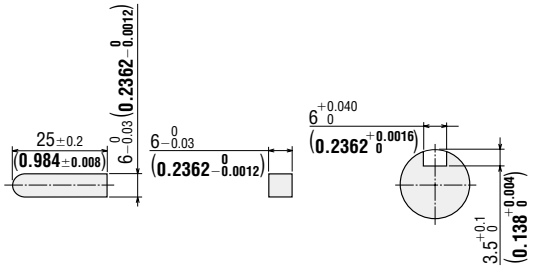
◇Motor/Gearhead (Combination type)

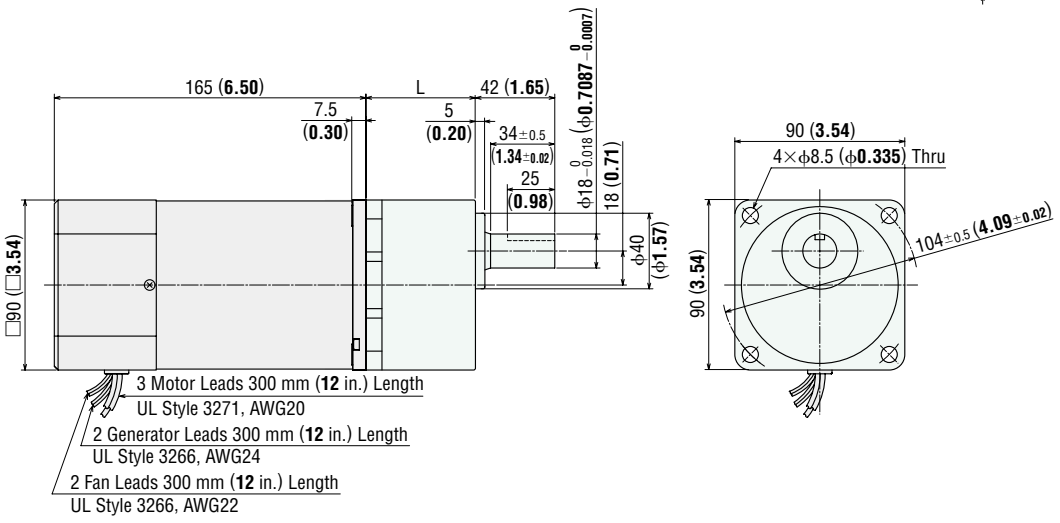
Model	Motor Model	Gearhead Model	Gear Ratio	L	DXF
VSI590A-□U	VSI590A-GVR	GVR5G□	**5**～**15**	45 (1.77)	A396A
VSI590C-□E	VSI590C-GVR		**18**～**36**	58 (2.28)	A396B
VSR590A-□U	VSR590A-GVR				
VSR590C-□E	VSR590C-GVR		**50**～**180**	70 (2.76)	A396C

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

Mass: 4.8 kg (10.6 lb.) (Including gearhead)

◇Key and Key Slot (Included)





●World **K** Series

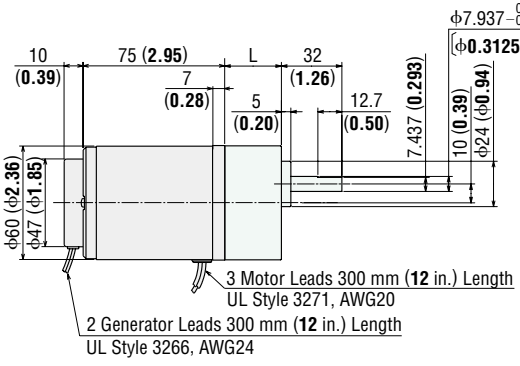
●Mounting screws are included with gearheads.

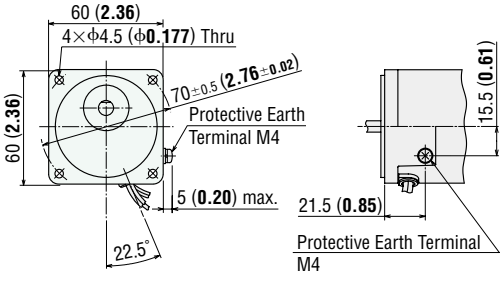
◇Motor/Gearhead

Model	Gearhead Model	Gear Ratio	L	DXF
2IK6RGN-AW2U **2IK6RGN-CW2E** **2RK6RGN-AW2U** **2RK6RGN-CW2E**	**2GN□SA**	**3**～**18**	30 (1.18)	A504AU
		25～**180**	40 (1.57)	A504BU

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

Mass: Motor 0.8 kg (1.76 lb.)
Gearhead 0.4 kg (0.88 lb.)





Detail Drawing of Protective Earth Terminal

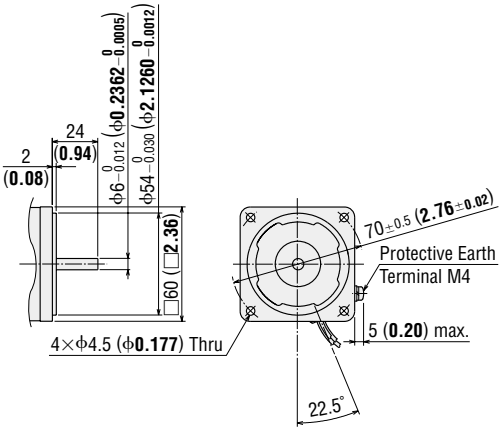
◇Shaft Section of Round Shaft Type

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

2IK6RA-AW2U, **2IK6RA-CW2E**

2RK6RA-AW2U, **2RK6RA-CW2E**

Mass: 0.8 kg (1.76 lb.)

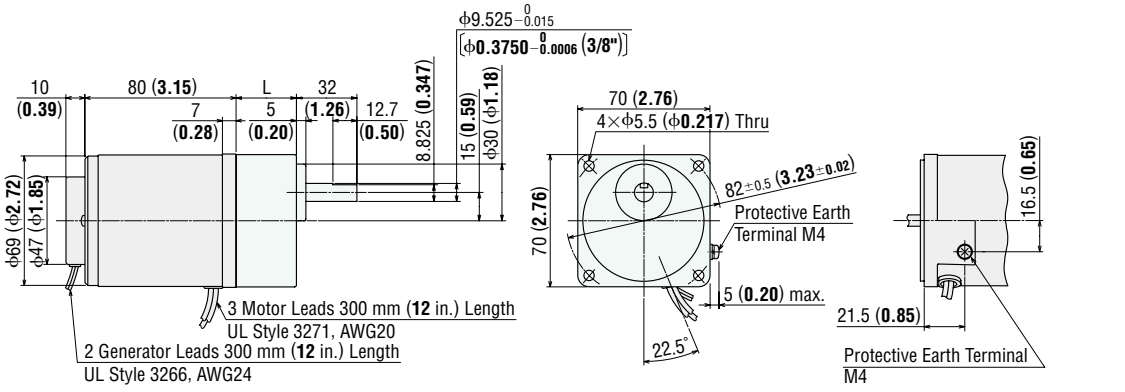


◇Motor/Gearhead

Motor Model	Gearhead Model	Gear Ratio	L	DXF
3IK15RGN-AW2U **3IK15RGN-CW2E** **3RK15RGN-AW2U** **3RK15RGN-CW2E**	**3GN□SA**	**3**~**18**	32 (1.26)	A506AU
		25~**180**	42 (1.65)	A506BU

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

Mass: Motor 1.2 kg (2.6 lb.)
Gearhead 0.55 kg (1.21 lb.)



Detail Drawing of Protective Earth Terminal

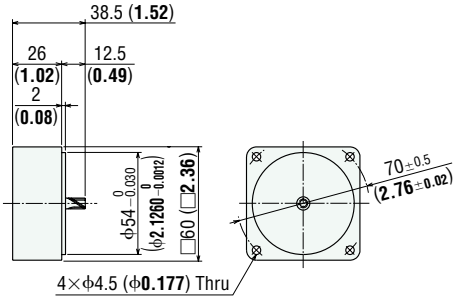
◇Decimal Gearhead

Can be connected to **GN** pinion shaft type.

2GN10XS

Mass: 0.2 kg (0.44 lb.)

DXF A003



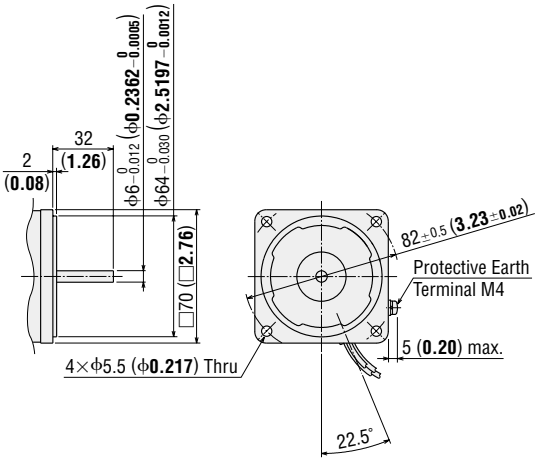
◇Shaft Section of Round Shaft Type

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

3IK15RA-AW2U, **3IK15RA-CW2E**

3RK15RA-AW2U, **3RK15RA-CW2E**

Mass: 1.2 kg (2.6 lb.)



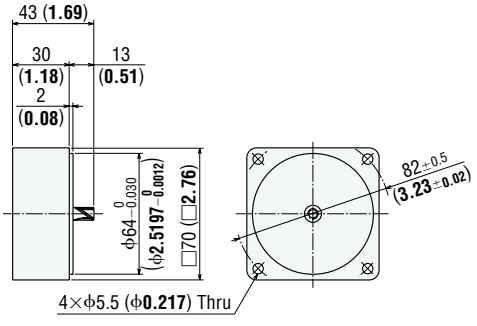
◇Decimal Gearhead

Can be connected to **GN** pinion shaft type.

3GN10XS

Mass: 0.3 kg (0.66 lb.)

DXF A009

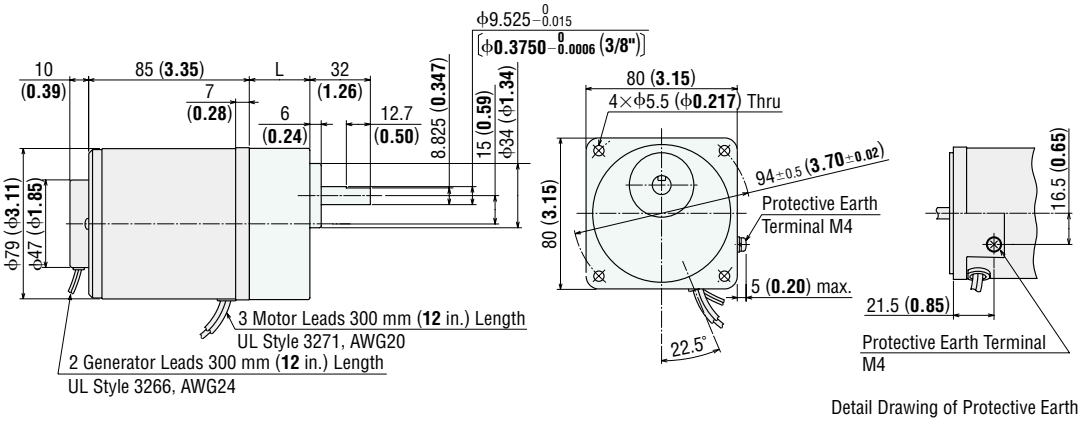


◇Motor/Gearhead

Motor Model	Gearhead Model	Gear Ratio	L	DXF
4IK25RGN-AW2U **4IK25RGN-CW2E** **4RK25RGN-AW2U** **4RK25RGN-CW2E**	**4GN□SA**	**3**～**18**	32 (1.26)	A508AU
		25～**180**	42.5 (1.67)	A508BU

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

Mass: Motor 1.6 kg (3.5 lb.)
Gearhead 0.65 kg (1.43 lb.)



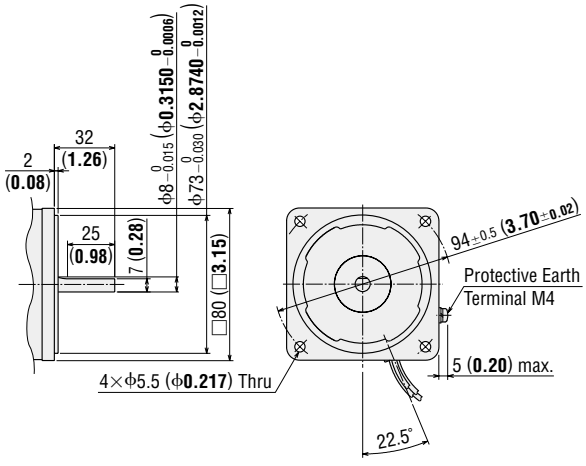
Detail Drawing of Protective Earth Terminal

◇Shaft Section of Round Shaft Type

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

4IK25RA-AW2U, **4IK25RA-CW2E**
4RK25RA-AW2U, **4RK25RA-CW2E**

Mass: 1.6 kg (3.5 lb.)



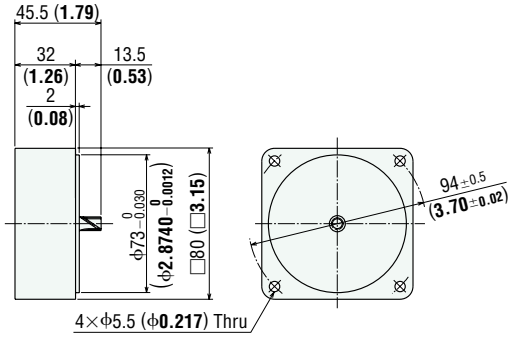
◇Decimal Gearhead

Can be connected to **GN** pinion shaft type.

4GN10XS

Mass: 0.4 kg (0.88 lb.)

DXF A013

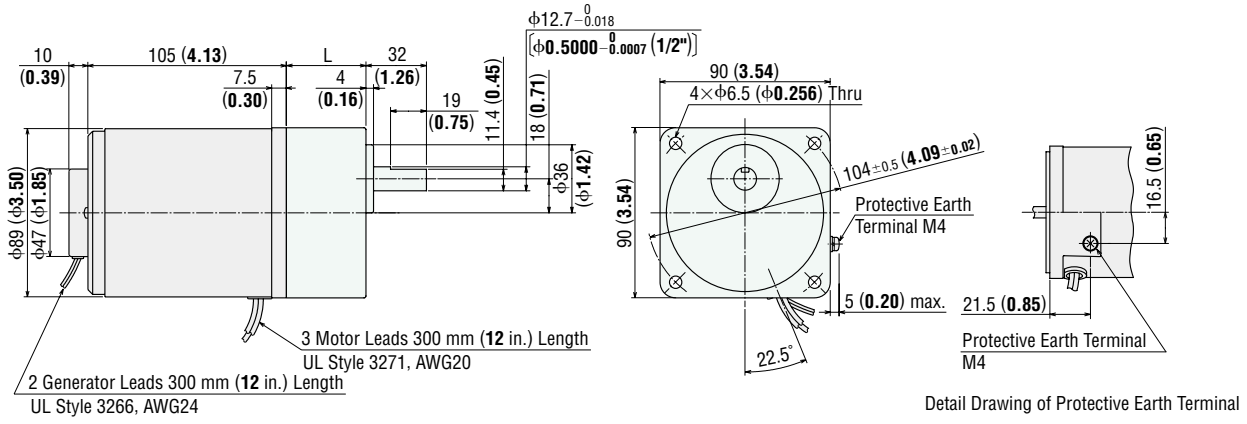


◇Motor/Gearhead

Motor Model	Gearhead Model	Gear Ratio	L	DXF
5IK40RGN-AW2U **5IK40RGN-CW2E** **5RK40RGN-AW2U** **5RK40RGN-CW2E**	**5GN□SA**	**3**～**18**	42 (1.65)	A510AU
		25～**180**	60 (2.36)	A510BU

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

Mass: Motor 2.6 kg (5.7 lb.)
Gearhead 1.5 kg (3.3 lb.)



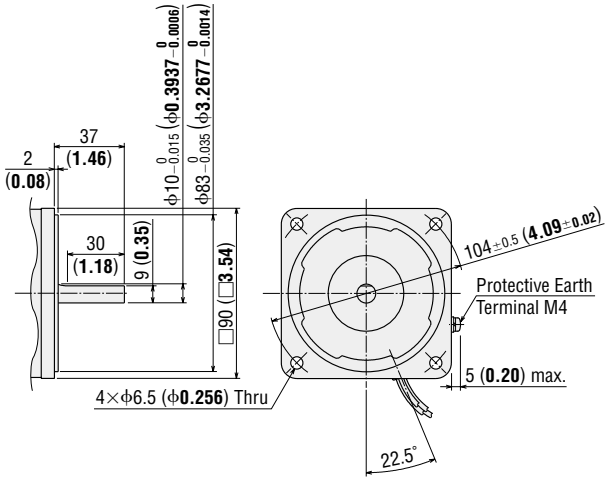
Detail Drawing of Protective Earth Terminal

◇Shaft Section of Round Shaft Type

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

5IK40RA-AW2U, **5IK40RA-CW2E**
5RK40RA-AW2U, **5RK40RA-CW2E**

Mass: 2.6 kg (5.7 lb.)



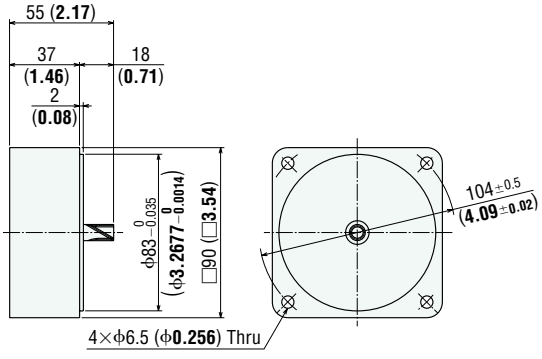
◇Decimal Gearhead

Can be connected to **GN** pinion shaft type.

5GN10XS

Mass: 0.6 kg (1.32 lb.)

DXF A022

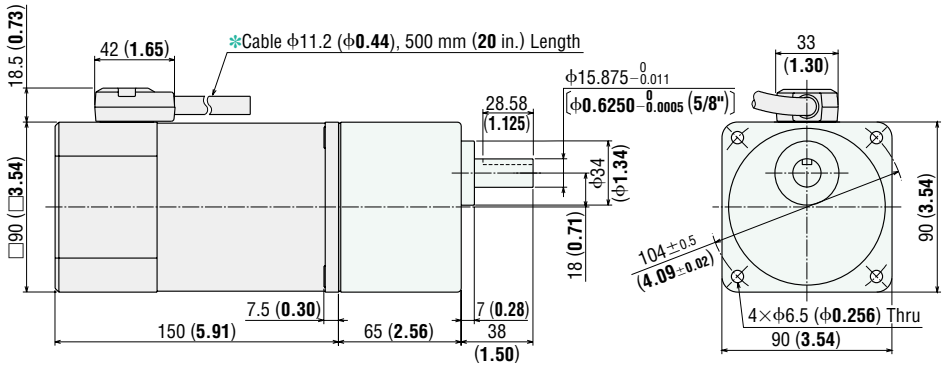


◇Motor/Gearhead

Motor Model	Gearhead Model	Gear Ratio	DXF
5IK60RGU-AWU **5IK60RGU-CWE** **5RK60RGU-AWU** **5RK60RGU-CWE**	**5GU□KA**	**3~180**	A069U

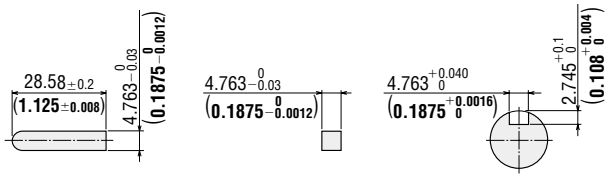
● Enter the gear ratio in the box (□) within the model name.

Mass: Motor 3.2 kg (7.0 lb.)
Gearhead 1.5 kg (3.3 lb.)



✻Cable Cores
3 Motor Leads: UL Style 3266, AWG20
2 Cooling Fan Leads: UL Style 3266, AWG24
2 Generator Leads: UL Style 3266, AWG24

◇Key and Key Slot (The key is included with the gearhead)

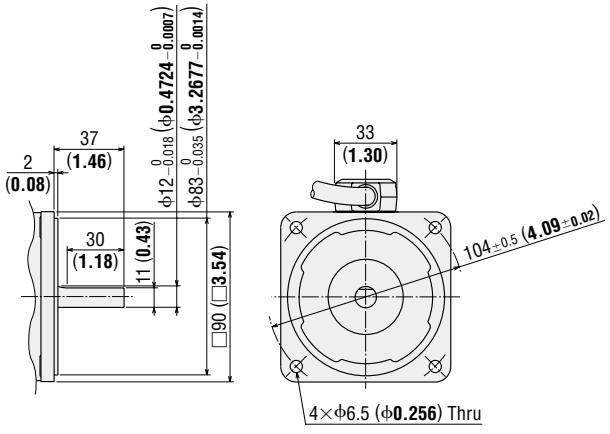


◇Shaft Section of Round Shaft Type

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

5IK60RA-AWU, **5IK60RA-CWE**
5RK60RA-AWU, **5RK60RA-CWE**

Mass: 3.2 kg (7.0 lb.)



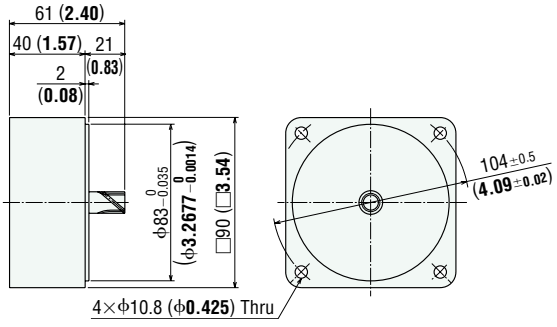
◇Decimal Gearhead

Can be connected to **GU** pinion shaft type.

5GU10XKB

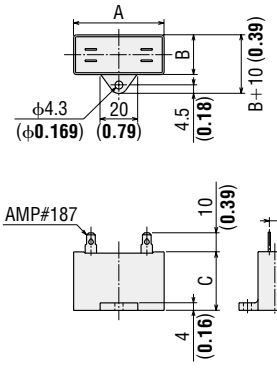
Mass: 0.6 kg (1.32 lb.)

DXF A029

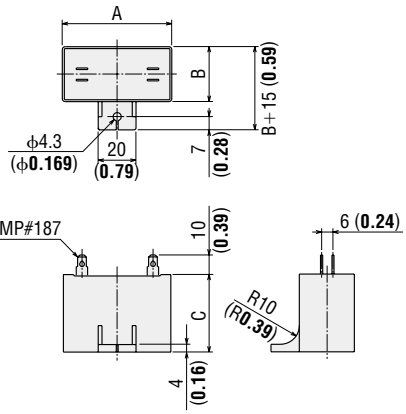


◇Capacitor (Included)

Dimension No.①



Dimension No.②



◇Capacitor Dimensions mm (in.)

• Induction Motors

Model		Capacitor Model	Dimensions mm (in.)			Mass g (oz.)	Dimension No.
V Series (Combination type)	World **K** Series (Pinion shaft type)		A	B	C		
VSI206A2-□U	**2IK6RGN-AW2U**	CH25FAUL2	31 (1.22)	17 (0.67)	27 (1.06)	25 (0.88)	①
VSI206C2-□E	**2IK6RGN-CW2E**	CH06BFAUL	31 (1.22)	14.5 (0.57)	23.5 (0.93)	15 (0.53)	
VSI315A2-□U	**3IK15RGN-AW2U**	CH45FAUL2	37 (1.46)	18 (0.71)	27 (1.06)	30 (1.06)	
VSI315C2-□E	**3IK15RGN-CW2E**	CH10BFAUL	37 (1.46)	18 (0.71)	27 (1.06)	30 (1.06)	
VSI425A2-□U	**4IK25RGN-AW2U**	CH65CFAUL2	48 (1.89)	19 (0.75)	29 (1.14)	40 (1.41)	
VSI425C2-□E	**4IK25RGN-CW2E**	CH15BFAUL	38 (1.50)	21 (0.83)	31 (1.22)	35 (1.24)	
VSI540A2-□U	**5IK40RGN-AW2U**	CH90CFAUL2	48 (1.89)	22.5 (0.89)	31.5 (1.24)	45 (1.59)	
VSI540C2-□E	**5IK40RGN-CW2E**	CH23BFAUL	48 (1.89)	21 (0.83)	31 (1.22)	40 (1.41)	
VSI560A-□U	**5IK60RGU-AWU**	CH180CFAUL	58 (2.28)	23.5 (0.93)	37 (1.46)	70 (2.5)	②
VSI560C-□E	**5IK60RGU-CWE**	CH40BFAUL	58 (2.28)	23.5 (0.93)	37 (1.46)	70 (2.5)	
VSI590A-□U	–	CH200CFAUL	58 (2.28)	29 (1.14)	41 (1.61)	95 (3.4)	
VSI590C-□E	–	CH60BFAUL	58 (2.28)	29 (1.14)	41 (1.61)	85 (3.0)	

- A capacitor cap is included with a capacitor.
- Enter the gear ratio in the box (□) within the model name.
- The capacitors of the World **K** Series round shaft type are the same as those of pinion shaft type with the same output power and voltage.

• Reversible Motors

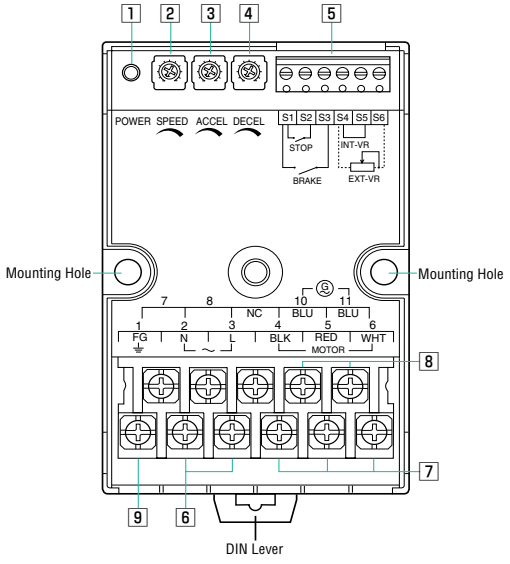
Model		Capacitor Model	Dimensions mm (in.)			Mass g (oz.)	Dimension No.
V Series (Combination type)	World **K** Series (Pinion shaft type)		A	B	C		
VSR206A2-□U	**2RK6RGN-AW2U**	CH35FAUL2	31 (1.22)	17 (0.67)	27 (1.06)	25 (0.88)	①
VSR206C2-□E	**2RK6RGN-CW2E**	CH08BFAUL	31 (1.22)	17 (0.67)	27 (1.06)	20 (0.71)	
VSR315A2-□U	**3RK15RGN-AW2U**	CH60CFAUL2	38 (1.50)	21 (0.83)	31 (1.22)	40 (1.41)	
VSR315C2-□E	**3RK15RGN-CW2E**	CH15BFAUL	38 (1.50)	21 (0.83)	31 (1.22)	35 (1.24)	
VSR425A2-□U	**4RK25RGN-AW2U**	CH80CFAUL2	48 (1.89)	21 (0.83)	31 (1.22)	45 (1.59)	
VSR425C2-□E	**4RK25RGN-CW2E**	CH25BFAUL	48 (1.89)	21 (0.83)	31 (1.22)	45 (1.59)	
VSR540A2-□U	**5RK40RGN-AW2U**	CH120CFAUL2	58 (2.28)	22 (0.87)	35 (1.38)	60 (2.1)	
VSR540C2-□E	**5RK40RGN-CW2E**	CH35BFAUL	58 (2.28)	22 (0.87)	35 (1.38)	55 (1.94)	
VSR560A-□U	**5RK60RGU-AWU**	CH200CFAUL	58 (2.28)	29 (1.14)	41 (1.61)	95 (3.4)	②
VSR560C-□E	**5RK60RGU-CWE**	CH50BFAUL	58 (2.28)	29 (1.14)	41 (1.61)	85 (3.0)	
VSR590A-□U	–	CH300CFAUL	58 (2.28)	35 (1.38)	50 (1.97)	140 (4.9)	
VSR590C-□E	–	CH70BFAUL	58 (2.28)	35 (1.38)	50 (1.97)	130 (4.6)	

- A capacitor cap is included with a capacitor.
- Enter the gear ratio in the box (□) within the model name.
- The capacitors of the World **K** Series round shaft type are the same as those of pinion shaft type with the same output power and voltage.

Connection and Operation

Names and Functions of Speed Controller Parts

The illustration shows the controller with the cover removed. Install the cover after connection.
Figures in parentheses represent pin numbers.



1 **POWER LED (POWER)**
Lights (green) while power is being supplied.

2 **Internal speed potentiometer (SPEED)**
Sets the motor's operating speed.

3 **Acceleration time potentiometer (ACCEL)**
Sets the acceleration time at starting of motor.

4 **Deceleration time potentiometer (DECEL)**
Sets the deceleration time at stopping of motor.

5 **Control input terminal**
S1: Common terminal for running and braking
S2: Run/Stop input
Runs (OFF) or stops (ON) the motor.
S3: Run/Brake input
Runs (OFF) or brakes (ON) the motor.
S4, S5, S6: Speed potentiometer inputs
When S4 and S5 are shorted, the speed can be set using the internal speed potentiometer (INT-VR).
When S4 and S5 are open, the speed can be set using an external speed potentiometer (EXT-VR).
When using an external speed potentiometer, connect it to S4 and S6.

6 **Power connection terminal (terminals 2 and 3)**

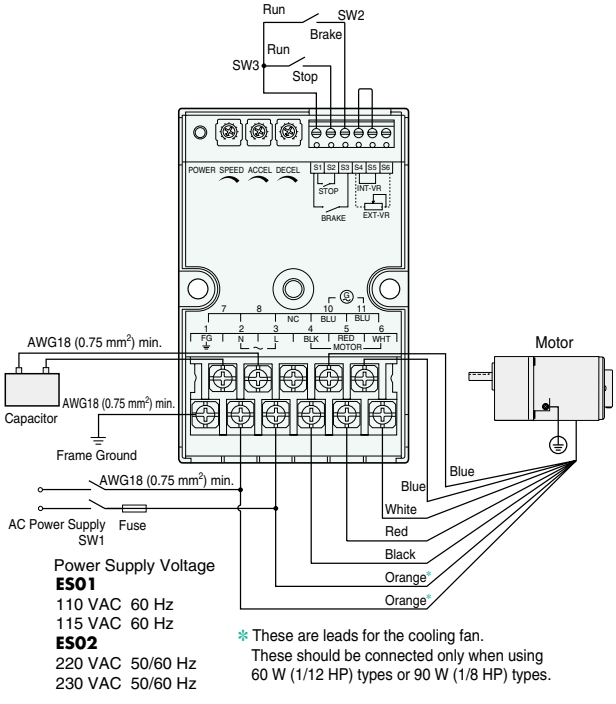
7 **Motor connection terminal (terminals 4, 5 and 6)**

8 **Generator connection terminal (terminals 10 and 11)**

9 **FG terminal (terminal 1)**

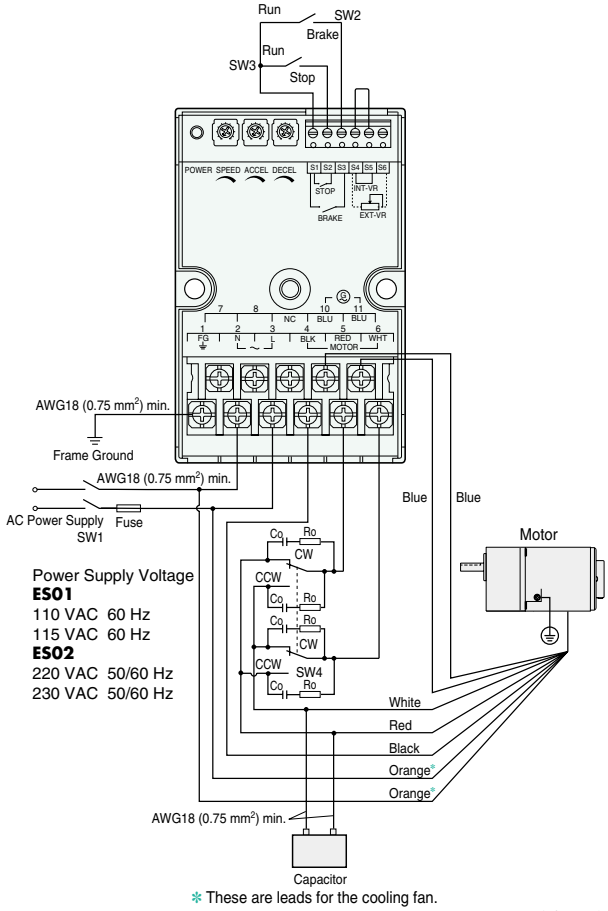
Connection Diagrams

◇Uni-Directional Operation (When using internal speed potentiometer)



- For uni-directional operation, connect the red lead to motor connection terminal 5, and the white lead to terminal 6. In this case, the motor rotates in the clockwise direction, as viewed from the motor output shaft.
  If you connect the white lead to terminal 5 and the red lead to terminal 6, the motor rotates in the counterclockwise direction, as viewed from the motor output shaft.
- When using an external speed potentiometer, refer to page 29.

◇Bi-Directional Operation (When using internal speed potentiometer)



●Specifications of the Switches and Fuse

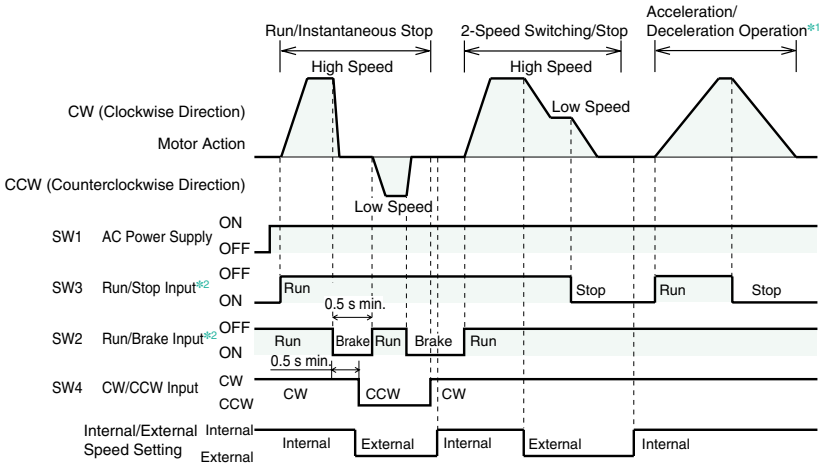
Power Supply Voltage	110/115 VAC (**ES01**)	220/230 VAC (**ES02**)
SW1	125 VAC 10 A	250 VAC 5 A
SW2, SW3	18 VDC 1 mA	
SW4	125 VAC 10 A	250 VAC 5 A
Ro, Co (CR circuit for surge suppression)	Ro=5~200 Ω, Co=0.1~0.2 μF, 200 WV	Ro=5~200 Ω, Co=0.1~0.2 μF, 400 WV
Fuse	Product recognized by UL/CSA in accordance with UL/CSA 248-14 or equivalent, 250 VAC 10 A	Product recognized by UL/CSA in accordance with UL/CSA 248-14 or equivalent, 250 VAC 5 A

Notes:

- The control input terminals are not insulated from the AC power supply. Any equipment (programmable controller, relay and switch) that will be connected to the control input terminals must have contact ratings of 18 VDC and 1 mA minimum. Do not use a transistor output type controller.
- The length of the cable connecting the motor and speed controller should be 10 m (32.8 ft.) or less. The length of the control cable should be 2 m (6.6 ft.) or less and as short as possible.
- Be sure to connect a CR circuit for surge suppression across SW4. **EPCR1201-2** (CR circuit) is available as an accessory. ➜ Page 35

●Timing Chart

The timing chart below shows an example of two-level speed control operation when the high speed and low speed are selected via the internal and external speed potentiometers, respectively.



*1 Case where the acceleration and deceleration times are set longer by turning each potentiometer clockwise.
*2 In case SW2 and SW3 are turned on at the same time, brake input (SW2) is given priority.

◇Run/Brake, Stop

Setting SW2/SW3 to "Run" (OFF) causes the motor to rotate at the speed set via the speed potentiometers.
Setting SW2 to "Brake" (ON) during operation causes the motor to stop instantaneously.
Setting SW3 to "Stop" (ON) during operation causes the motor to coast to a stop.

Run/Stop Input	Run/Brake Input	Motor Operation
OFF	OFF	Run
OFF	ON	Instantaneous stop
ON	OFF	Coast to a stop*

*When the deceleration time set with a potentiometer is longer than the time which motor coasts to a stop, motor will stop with deceleration time.

The braking function (current through the motor) is only active for approximately 0.4 second after the Run/Brake input is turned ON. Do not switch SW2, SW3, SW4 within 0.5 second after Run/Brake input is turned ON.

◇Switching the Rotation Direction

SW4 is used to switch the rotation direction of motor. When SW4 is set to CW, the motor rotates in the clockwise direction, as viewed from the motor output shaft. When SW4 is set to CCW, the motor rotates in the counterclockwise direction, as viewed from the motor output shaft.

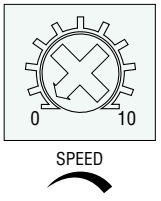
- Be sure to connect a surge suppressor to SW4. **EPCR1201-2** CR circuit for surge suppression is available as an accessory. ➜ Page 35
- Instantaneous bi-directional operation is possible with a reversible motor.
- For bi-directional operation of an induction motor, switch the rotation direction after the motor has come to a complete stop.

●Speed Setting Methods

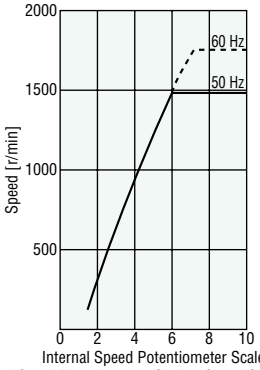
The following two methods of setting speed can be used.
Multi-motor control or DC voltage control cannot be used.

◇Internal Speed Potentiometer

The setting speed range is 90 to 1400 r/min at 50 Hz, or 90 to 1600 r/min at 60 Hz.
Short the speed potentiometer input terminals S4 and S5.
When the dial on the internal speed potentiometer is turned in the clockwise direction, the set speed will be faster.
The factory setting is 0 r/min.



Internal Speed Potentiometer



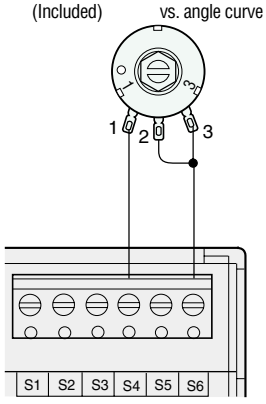
Internal Speed Potentiometer Scale – Speed Characteristics (Representative values)

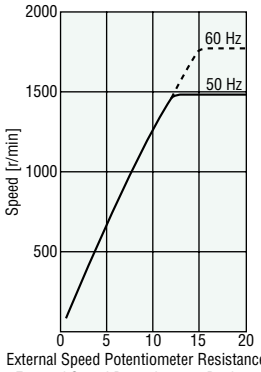
◇External Speed Potentiometer (Included)

Open the speed potentiometer input terminals S4 and S5.
Before connecting, turn the dial on the external speed potentiometer in the counterclockwise direction to set the speed to 0 r/min.
When the dial on the external speed potentiometer is turned in the clockwise direction, the set speed will be faster.

External Speed Potentiometer (Included)

20 kΩ 1/4 W, with a linear resistance vs. angle curve



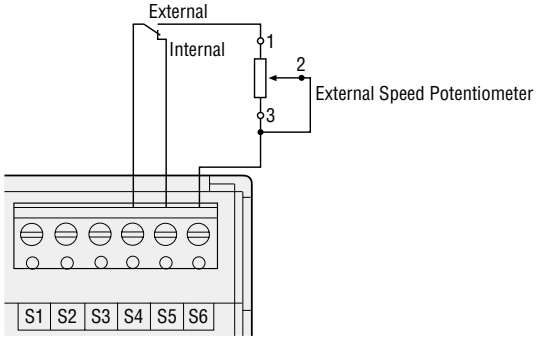


External Speed Potentiometer Resistance – Speed Characteristics (Representative values)

Note:
Do not operate multiple speed controllers with a single external speed potentiometer. This may damage the speed controllers.

●Two-Level Speed Control

The motor can be controlled over two-level speed by switching between the internal and external speed potentiometers. Select the internal speed potentiometer or external speed potentiometer with speed setting switch.



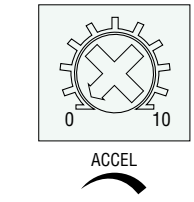
Note:
The control input terminals are not insulated from the AC power supply.
Any equipment (programmable controller, relay and switch) that will be connected to the control input terminals must have contact ratings of 18 VDC and 1 mA minimum.
Do not use a transistor output type programmable controller.

●Acceleration (ACCEL) and Deceleration (DECEL) Operation

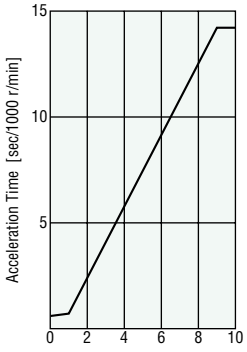
Equipment and loads are subject to large acceleration/deceleration force when starting, stopping, and changing speed. When you want to accelerate/decelerate without any accompanying shock, the acceleration/deceleration time can be extended using the acceleration/deceleration function. The acceleration/deceleration time can be set using acceleration/deceleration time potentiometers built in the controller. The setting range is approximately 0.5 to 10 seconds (at 1000 r/min, with no inertial load).
However, when the load inertia is large, the deceleration time cannot be set at a shorter time than when the motor is coasted to a stop.

◇Acceleration (ACCEL)

The acceleration function is activated at starting or when the speed is switched to the higher setting in a two-level speed control.
When the dial on the acceleration time potentiometer is turned in the clockwise direction, the set time will be longer.
The factory setting is 0 (no acceleration).



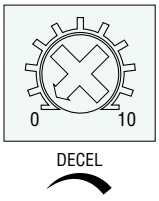
Acceleration Time Potentiometer



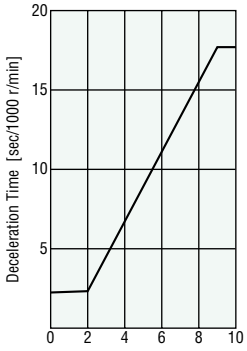
Acceleration Time Potentiometer Scale
(Representative values)

◇Deceleration (DECEL)

The deceleration function is activated at coast to a stop or when the speed is switched to the lower setting in a two-level speed control.
When the dial on the deceleration time potentiometer is turned in the clockwise direction, the set time will be longer.
The factory setting is 0 (no deceleration).



Deceleration Time Potentiometer



Deceleration Time Potentiometer Scale
(Representative values)

●Repeated Running/Braking Cycle

When running/braking of the motor is repeated in short cycles, the motor temperature rise will increase and the continuous operation time will be limited. Use the following values shown below.
The motor may generate heat depending on drive conditions. Ensure that the temperature of the motor case does not exceed 90˚C (194˚F).

Motor Output Power	Repetition Cycle
6 W (1/125 HP) to 40 W (1/19 HP)	2 seconds min. (Running 1 second, stopping 1 second)
60 W (1/12 HP), 90 W (1/8 HP)	4 seconds min. (Running 2 seconds, stopping 2 seconds)

●Braking Current

●When the motor is stopped instantaneously, a large braking current flows through the motor. When connecting a circuit breaker (or fuse), refer to the table below for the braking current (peak value) and select its current capacity.
●Be careful that repeated motor running and braking may cause the motor's temperature to rise.

Motor Output Power	Braking Current (Peak value) [A]	
	Single-Phase 110/115 VAC	Single-Phase 220/230 VAC
6 W (1/125 HP)	1.5	1.0
15 W (1/50 HP)	3.5	2.0
25 W (1/30 HP)	5.5	4.0
40 W (1/19 HP)	8.5	6.0
60 W (1/12 HP)	15.5	8.0
90 W (1/8 HP)	20.5	12.0

■List of Motor and Gearhead Combinations

●Model names for motor and gearhead combinations are shown below.

●Induction Motors

Model	Motor Model	Gearhead Model
VSI206A2-□U	VSI206A2-GV	GV2G□
VSI206C2-□E	VSI206C2-GV	
VSI315A2-□U	VSI315A2-GV	GV3G□
VSI315C2-□E	VSI315C2-GV	
VSI425A2-□U	VSI425A2-GV	GV4G□
VSI425C2-□E	VSI425C2-GV	
VSI540A2-□U	VSI540A2-GVH	GVH5G□
VSI540C2-□E	VSI540C2-GVH	
VSI560A-□U	VSI560A-GVH	GVH5G□
VSI560C-□E	VSI560C-GVH	
VSI590A-□U	VSI590A-GVR	GVR5G□
VSI590C-□E	VSI590C-GVR	

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

●Reversible Motors

Model	Motor Model	Gearhead Model
VSR206A2-□U	VSR206A2-GV	GV2G□
VSR206C2-□E	VSR206C2-GV	
VSR315A2-□U	VSR315A2-GV	GV3G□
VSR315C2-□E	VSR315C2-GV	
VSR425A2-□U	VSR425A2-GV	GV4G□
VSR425C2-□E	VSR425C2-GV	
VSR540A2-□U	VSR540A2-GVH	GVH5G□
VSR540C2-□E	VSR540C2-GVH	
VSR560A-□U	VSR560A-GVH	GVH5G□
VSR560C-□E	VSR560C-GVH	
VSR590A-□U	VSR590A-GVR	GVR5G□
VSR590C-□E	VSR590C-GVR	

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

Common Specifications

Permissible Overhung Load and Permissible Thrust Load of Motors

Permissible Overhung Load

Motor		Permissible Overhung Load N (lb.)	
Frame Size □ mm (in.)	Output Shaft Diameter ϕ mm (in.)	Distance from Shaft End	
		10 mm (0.39 in.)	20 mm (0.79 in.)
60 (2.36)	6 (0.2362)	50 (11.2)	110 (24)
70 (2.76)	6 (0.2362)	40 (9)	60 (13.5)
80 (3.15)	8 (0.3150)	90 (20)	140 (31)
90 (3.54)	10 (0.3937)	140 (31)	200 (45)
90 (3.54)	12 (0.4724)	240 (54)	270 (60)

Permissible Thrust Load

Avoid thrust loads as much as possible. If thrust load is unavoidable, keep it to half or less of the motor mass.

Permissible Overhung Load and Permissible Thrust Load of Gearheads

Model	Gear Ratio	Max. Permissible Torque N·m (lb-in)	Permissible Overhung Load N (lb.)		Permissible Thrust Load N (lb.)
			10 mm (0.39 in.) from Shaft End	20 mm (0.79 in.) from Shaft End	
GV2G□	**5~9**	6.0 (53)	100 (22)	150 (33)	40 (9)
	12.5~25		150 (33)	200 (45)	
	30~360		200 (45)	300 (67)	
GV3G□	**5~9**	10 (88)	150 (33)	200 (45)	80 (18)
	12.5~25		200 (45)	300 (67)	
	30~360		300 (67)	400 (90)	
GV4G□	**5~9**	16 (141)	200 (45)	250 (56)	100 (22)
	12.5~25		300 (67)	350 (78)	
	30~360		450 (101)	550 (123)	
GVH5G□	**5~9**	30 (260)	400 (90)	500 (112)	150 (33)
	12.5~18		450 (101)	600 (135)	
	25~300		500 (112)	700 (157)	
GVR5G□	**5~9**	40 (350)	400 (90)	500 (112)	150 (33)
	12.5~18		450 (101)	600 (135)	
	25~180		500 (112)	700 (157)	
2GN□SA	**3~18**	3.0 (26)	50 (11.2)	80 (18)	30 (6.7)
	25~180		120 (27)	180 (40)	
3GN□SA	**3~18**	5.0 (44)	80 (18)	120 (27)	40 (9)
	25~180		150 (33)	250 (56)	
4GN□SA	**3~18**	8.0 (70)	100 (22)	150 (33)	50 (11.2)
	25~180		200 (45)	300 (67)	
5GN□SA	**3~18**	10 (88)	250 (56)	350 (78)	100 (22)
	25~180		300 (67)	450 (101)	
5GU□KA	**3~9**	20 (177)	400 (90)	500 (112)	150 (33)
	12.5~18		450 (101)	600 (135)	
	25~180		500 (112)	700 (157)	

Permissible Load Inertia of Gearhead: J

When a high load inertia (J) is connected to a gearhead, high torque is exerted instantaneously on the gearhead when starting up in frequent, discontinuous operations (or when stopped instantaneously). Excessive impact loads can cause the gearhead or motor damage.
The table below gives values for permissible load inertia on the motor shaft. Use the motor and gearhead within these parameters.
The permissible load inertia (J) on the gearhead output shaft is calculated with the following formulas.
The life of the gearhead when operating at the permissible load inertia with instantaneous stops of the speed control motors is approximately two million cycles.

Permissible Load Inertia at the Gearhead Output Shaft

Gear ratio 3:1 to 50:1 $J_G = J_M \times i^2$
Gear ratio 60:1 or higher $J_G = J_M \times 2500$

J_G : Permissible load inertia at the gearhead output shaft J [$\times 10^{-4}$kg·m^2 (oz-in^2)]
J_M : Permissible load inertia at the motor shaft J [$\times 10^{-4}$kg·m^2 (oz-in^2)]
i : Gear ratio (Example: $i = 3$ means the gear ratio of 3:1)

Permissible Load Inertia at the Motor Shaft

No. of Phase	Frame Size	Output Power	Permissible Load Inertia at the Motor Shaft J [$\times 10^{-4}$kg·m^2 (oz-in^2)]
Single-Phase	□60 mm (2.36 in.)	6 W (1/125 HP)	0.062 (0.34)
	□70 mm (2.76 in.)	15 W (1/50 HP)	0.14 (0.77)
	□80 mm (3.15 in.)	25 W (1/30 HP)	0.31 (1.70)
	□90 mm (3.54 in.)	40 W (1/19 HP)	0.75 (4.1) [1.1 (6.0)]*
		60 W (1/12 HP)	1.1 (6.0)
		90 W (1/8 HP)	1.1 (6.0)

*Values in the brackets are for the **V** Series.

Accessories

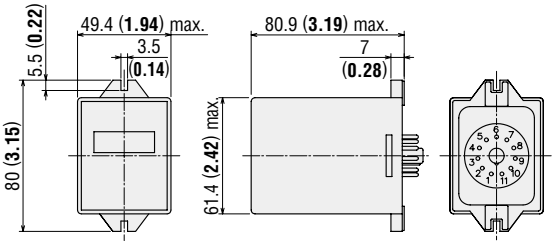
Digital Display Type Motor Speed Indicator RoHS

● Model: **SDM496**
Power supply voltage: Single-phase 100 VAC to 240 VAC

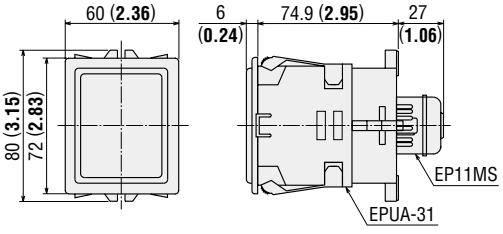
This product is a digital speed indicator that directly displays the speed at the output shaft of the motor or gearhead.
SDM496 is not approved by any safety standards.

● Included with **SDM496**
To mount in a panel, a recessed mounting adapter **EPUA-31** and round shape socket **EP11MS** are provided with the speed indicator.

● Dimensions Unit = mm (in.)
Mass: 200 g (7.1 oz.) DXF A100

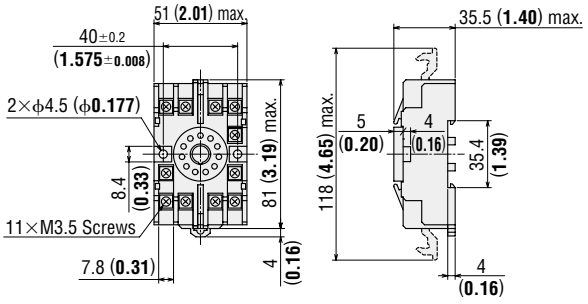


● Dimensions with Adapter Attached Unit = mm (in.)

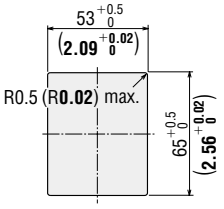


● Flush Mounting Socket for Mounting DIN Rail RoHS
This mounting socket is used for installing the motor speed indicators on DIN rails.

Model: **EP11PF** (Sold separately)
◇Dimensions Unit = mm (in.)
Mass: 75 g (2.6 oz.)



● Panel Cut-Out

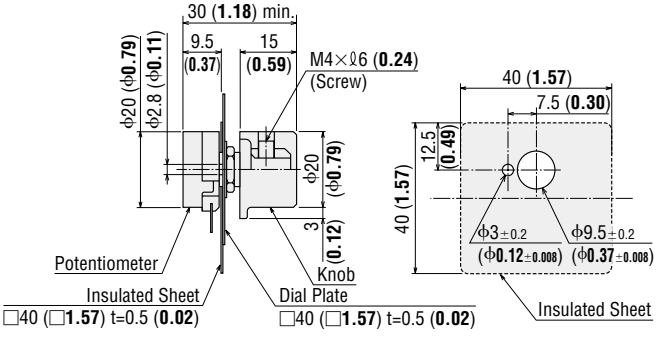


External Speed Potentiometer RoHS

● Model: **PAVR-20KZ**
(20 kΩ 1/4 W, with a linear resistance vs. angle curve)

Note:
ESO1/**ESO2** includes one set of this external speed potentiometer. Use it for multiple speed settings.

● Dimensions Unit = mm (in.)
Mass: 20 g (0.71 oz.)



Recommended thickness of a mounting plate is a maximum 4.5 mm (**0.18** in.).

Motor/Gearhead Mounting Brackets RoHS

Mounting Brackets for attaching and securing a motor and gearhead. They are high-strength types, which can be used with high power motors/gearheads. These brackets come with tapped holes. To mount the motor and gearhead, simply fasten with the screws provided to the gearhead. To mount the motor alone, mounting screws must be provided separately.

Please note that these mounting brackets cannot be used with the following products.
●Right-angle gearheads (**RH** type, **RAA** type)

For motor frame size: □60 mm (□2.36 in.)

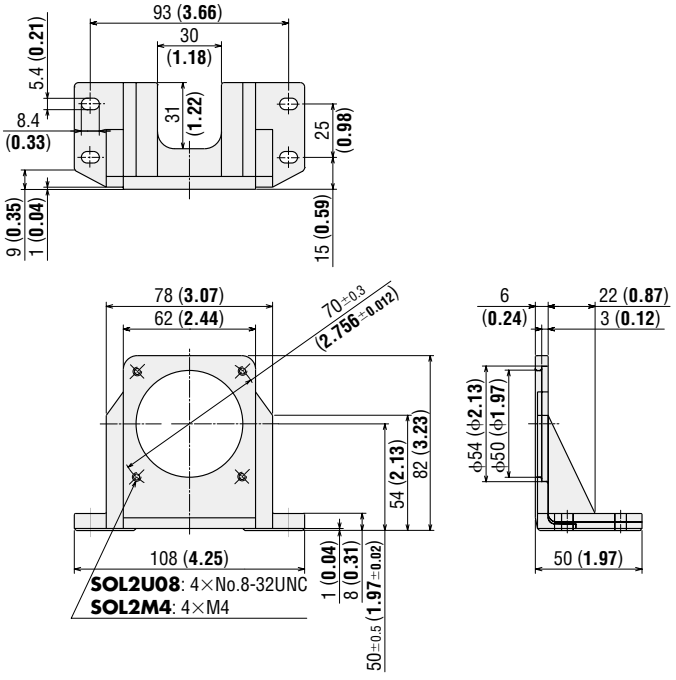
●Model: SOL2U08, SOL2M4

Mass: 135 g (4.7 oz.) Material: Aluminum alloy
DXF A321U (**SOL2U08**)
A321 (**SOL2M4**)

◇Applicable Products
· **SOL2U08**
2GN gearhead
Frame size 60 mm (2.36 in.) motor

· **SOL2M4**
GV2G gearhead

●Dimensions Unit = mm (in.)



For motor frame size: □70 mm (□2.76 in.)

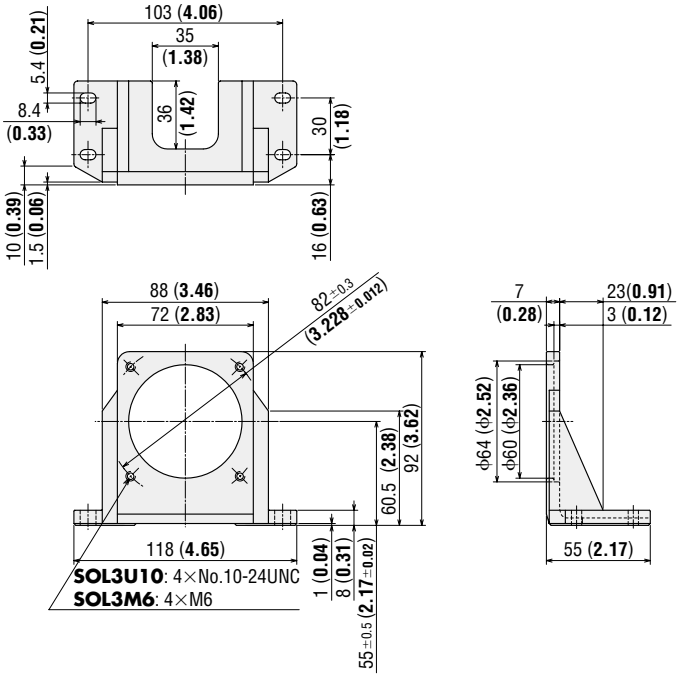
●Model: SOL3U10, SOL3M6

Mass: 175 g (6.2 oz.) Material: Aluminum alloy
DXF A322U (**SOL3U10**)
A323 (**SOL3M6**)

◇Applicable Products
· **SOL3U10**
3GN gearhead
Frame size 70 mm (2.76 in.) motor

· **SOL3M6**
GV3G gearhead

●Dimensions Unit = mm (in.)



For motor frame size: □80 mm (□3.15 in.)

● Model: **SOL4U10**, **SOL4M6**

Mass: 210 g (7.4 oz.) Material: Aluminum alloy

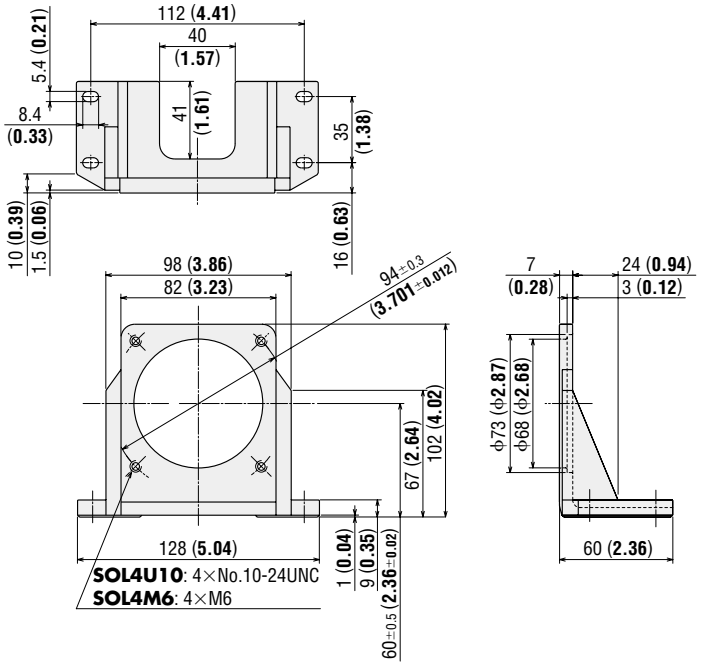
DXF A236U (**SOL4U10**)
A237 (**SOL4M6**)

◇Applicable Products

· **SOL4U10**
4GN gearhead
Frame size 80 mm (3.15 in.) motor

· **SOL4M6**
GV4G gearhead

● Dimensions Unit = mm (in.)



For motor frame size: □90 mm (□3.54 in.)

● Model: **SOL5UA**, **SOL5M8**

Mass: 270 g (9.5 oz.) Material: Aluminum alloy

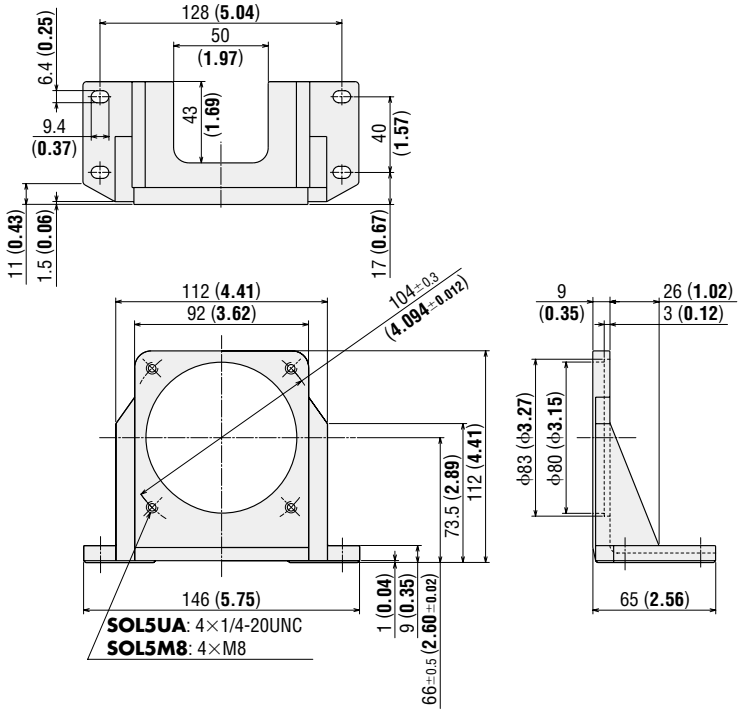
DXF A238U (**SOL5UA**)
A239 (**SOL5M8**)

◇Applicable Products

· **SOL5UA**
5GN gearhead
5GU□KA gearhead
Frame size 90 mm (3.54 in.) motor

· **SOL5M8**
GVH5G gearhead
GVR5G gearhead

● Dimensions Unit = mm (in.)

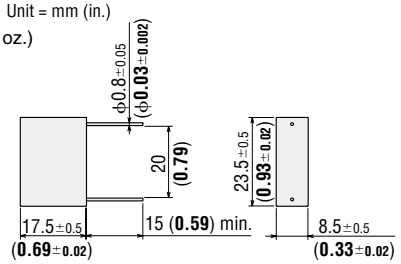


■CR Circuit for Surge Suppression RoHS

This product is used to protect the contacts of the relay or switch used for controlling the bi-directional operation of a motor.

● Model: **EPCR1201-2**
250 VAC (120 Ω, 0.1 μF)

● Dimensions Unit = mm (in.)
Mass: 5 g (0.18 oz.)



Flexible Couplings RoHS

These products are clamp type couplings to connect motor or gearhead shaft to the shaft of the equipment to be connected. Once the motor or gearhead are determined, the coupling can be selected.

Features

- Couplings come with shaft holes and have standardized combinations for different diameter shaft holes.
- Characteristics are the same for clockwise and counterclockwise rotation.
- Oil-resistant and electrically insulated
- Aluminum alloy construction
- The driven shaft is not damaged, since shafts are joined by clamping.
- Easy installation due to a separated hub and sleeve design

● Refer to page A-208 of the General Catalog 2006/2007 for details of the products.

◇V Series

Gearhead Model	Coupling Type
GV2G□	**MCL30**
GV3G□	**MCL30**
	MCL40
GV4G□	**MCL40**
	MCL55
GVH5G□ **GVR5G□**	**MCL55**

- Enter the gear ratio in the box (□) within the model name.
- Type of coupling varies depending on condition of the load.

◇World K Series

Gearhead Model	Coupling Type
2GN□SA	**MCL20**
	MCL30
3GN□SA	**MCL30**
4GN□SA	**MCL30**
	MCL40
5GN□SA **5GN□RAA**	**MCL30**
	MCL40
5GU□KA **5GU□RAA**	**MCL40**
	MCL55

- Enter the gear ratio in the box (□) within the model name.
- Type of coupling varies depending on condition of the load.

This product is manufactured at a plant certified with the international standards **ISO 9001** (for quality assurance) and **ISO 14001** (for systems of environmental management).

Specifications are subject to change without notice.
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