

AC Motor Speed Controller ES01/ES02

ES01 and **ES02** are Oriental Motor's newest speed controllers designed for ease of its functions and operations. A wide range of speed control motors is available for use with these new controllers.

Features

Multi-Functions

- Speed Control Range
90~1400 r/min (50 Hz) 90~1600 r/min (60 Hz)
- Speed Control Function
Acceleration/deceleration function that enables smooth start and stop

Speed Control Function

The **ES01/ES02** enables users to regulate the output speed of motors ranging from 6W to 90W.

IP20-Compliant

The IP20-compliant construction prevents the operator from touching the terminal block, thereby ensuring a high degree of safety.

Speed Controller Product Line

Speed Controller

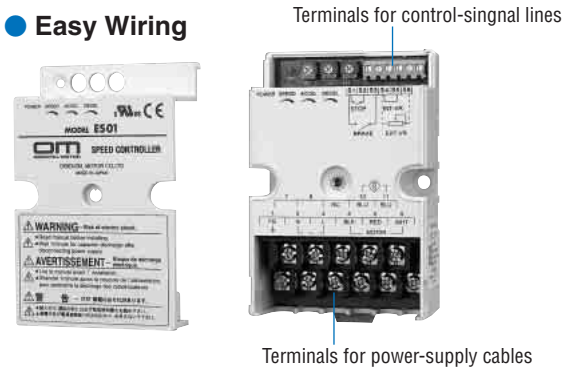
| Model | Voltage |
|-------------|--------------------------|
| ES01 | Single-Phase 100-115 VAC |
| ES02 | Single-Phase 200-230 VAC |



Compatible with Voltages in All Major Countries

The design conforms to typical global safety standards. The CE Marking is used in accordance with the EMC directives and low voltage directives.

Easy Wiring



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

Safety Standards and CE Marking

Speed Controllers

| Standards | Certification Body | Standards File No. | CE Marking |
|--|-------------------------|--------------------|--|
| UL508 CSA C.22.2 No.14 | UL | E91291 | Low Voltage Directive EMC Directive |
| EN50178 EN60950 EN50081-2 EN61000-6-2 | Conform to EN Standards | | |

• **Details of Safety Standards** → Page G-2

• The EMC value changes according to the wiring and layout. Therefore, the final EMC level must be checked incorporated in the equipment.



Specifications of Speed Controller

| Model Name | ES01 | ES02 |
|-----------------------------|---|-------------------------------|
| Voltage | Single-Phase 100-115 VAC ±10% | Single-Phase 200-230 VAC ±10% |
| Frequency | 50/60 Hz | |
| Operable Motor Output Power | World K Series: 6 W, 15 W, 25 W, 40 W, 60 W V Series: 6 W, 15 W, 25 W, 40 W, 60 W, 90 W | |
| Speed Range | 50 Hz: 90~1400 r/min, 60 Hz: 90~1600 r/min | |
| Function | Speed Control, Instantaneous Stop, Acceleration/Deceleration | |
| Insulation Resistance | 100 MΩ or more when 500 VDC is applied between the PE terminal and the power supply terminals, all the pins and the frame. | |
| Dielectric Strength | Sufficient to withstand 3.0 kV at 50 Hz, 60 Hz applied between all the pins and the frame for 1 minute. Sufficient to withstand 1.5 kV at 50 Hz, 60 Hz applied between the PE terminals and the power supply terminals for 1 min. | |
| Ambient Temperature Range | 32°F~104°F (0°C~+40°C) (nonfreezing) | |
| Ambient Humidity | 85% maximum (noncondensing) | |
| Degree of Protection | IP 20 (with cover) | |

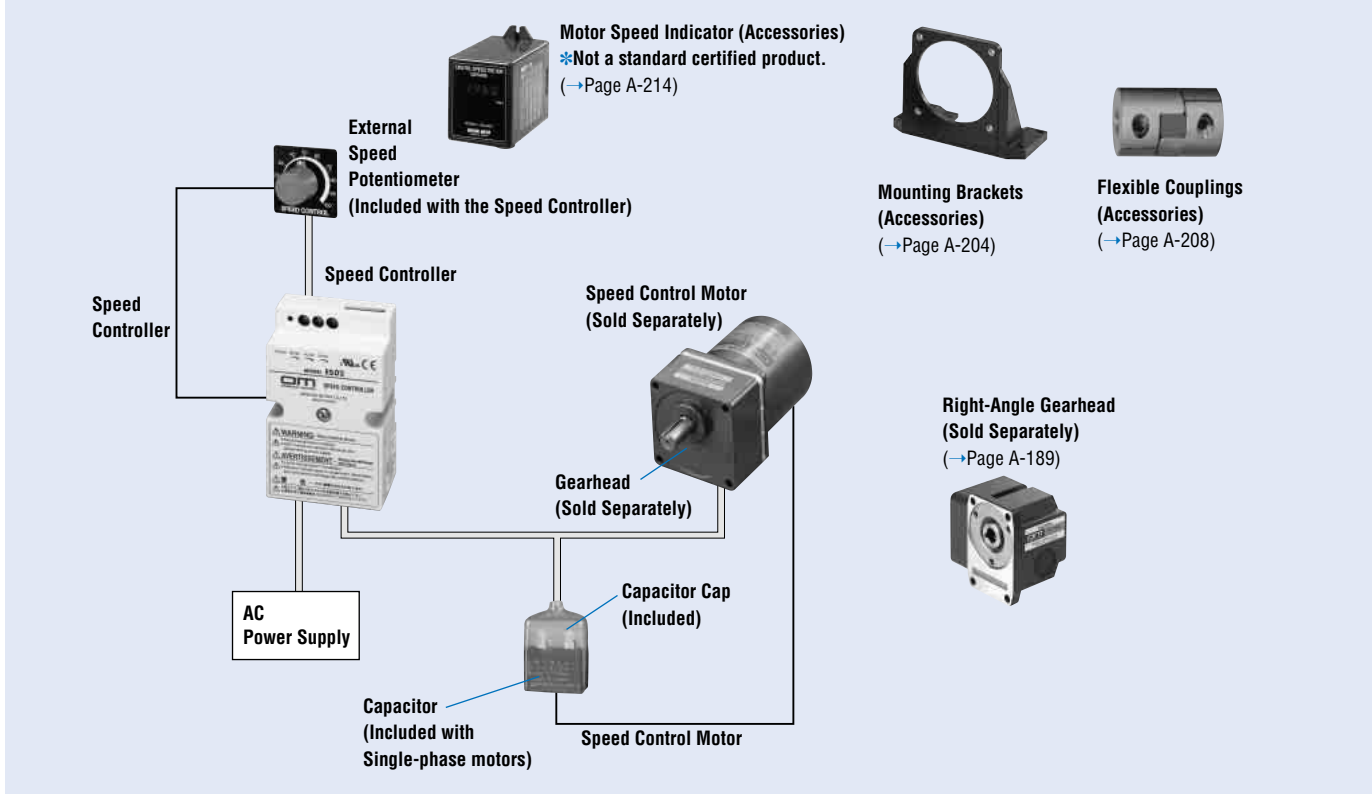
Notes:

- These models cannot be used for applications requiring the control of more than one motor/controller set by the same external potentiometer.
- When the motor is commanded to stop immediately, the large braking current will flow to the motor. See page B-115 for the braking current.

Dimensions → Page B-103

Connection and Operation → Page B-111

System Configuration



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

Applicable Speed Control Motor (Sold Separately)

World K Series Speed Control Motors 6 W~60 W

A tachometer generator built into our standard AC induction and reversible motors allows a wide range of speed control. This simple structure delivers high reliability at a low cost, making this system a popular solution for a wide range of applications.

V Series Speed Control Motors 6 W~90 W

The V series speed control motors provide quiet operation, long life and high strength performance, making them the perfect solution for many applications. The motor and gearhead come pre-assembled to make installation easy.

Safety Standards and CE Marking

Speed Control Motors

| Standards | Certification Body | Standards File No. | CE Marking |
|---|--------------------|------------------------------------|-----------------------|
| UL1004 UL2111 CSA C.22.2 No.100 CSA C.22.2 No.77 | UL | E64199 (6 W) E64197 (15 W~90 W) | Low Voltage Directive |
| EN60950 EN60034-1 EN60034-5 IEC60034-11* | | Conform to EN Standards | |

* 15 W~40 W Type

● **Details of Safety Standards** →Page G-2

● When the motor is approved under various standards, the model name on the nameplate is the approved model name.

List of Safety Standard Approved Products →Page G-17, G-18

■ Product Number Code

● World K Series Speed Control Motors

4 I K 25 R GN - AW U

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

| | |
|---|--|
| ① | Motor Frame Size |
| ② | I : Induction Motor R : Reversible Motor |
| ③ | K Series |
| ④ | Output Power (W) Example 25 : 25 W |
| ⑤ | Speed Control Motor |
| ⑥ | Motor Shaft Type GN : Pinion Shaft for use with GN -type gearhead GU : Pinion Shaft for use with GU -type gearhead A : Round Shaft |
| ⑦ | Voltage AW : Single-Phase 110-115 VAC CW : Single-Phase 220-230 VAC |
| ⑧ | With Capacitor for U : Single-Phase 110-115 VAC E : Single-Phase 220-230 VAC |

● For World K Series Gearheads

4 GN 50 KA

① ② ③ ④

| | |
|---|--|
| ① | Gearhead Frame Size |
| ② | Gearhead Type GN : For use with GN -type pinion shaft motor GU : For use with GU -type pinion shaft motor |
| ③ | Gear Ratio Example 50 : Gear Ratio of 50:1 |
| ④ | Type of Bearings and Shaft Type KA : Ball Bearing Type (inch-size) RAA : Right Angle Solid Shaft Type (inch size) RH : Right Angle Hollow Shaft Type |

■ Product Line

● World K Series Speed Control Motors

◆ Single-Phase 110/115 VAC

| Output Power HP W | Induction Motors | | Reversible Motors | | Speed Controller |
|----------------------|---------------------|--------------------|---------------------|--------------------|------------------|
| | Pinion Shaft Type | Round Shaft Type | Pinion Shaft Type | Round Shaft Type | |
| 1/125 6 | 2IK6RGN-AWU | 2IK6RA-AWU | 2RK6RGN-AWU | 2RK6RA-AWU | ES01 |
| 1/50 15 | 3IK15RGN-AWU | 3IK15RA-AWU | 3RK15RGN-AWU | 3RK15RA-AWU | |
| 1/30 25 | 4IK25RGN-AWU | 4IK25RA-AWU | 4RK25RGN-AWU | 4RK25RA-AWU | |
| 1/19 40 | 5IK40RGN-AWU | 5IK40RA-AWU | 5RK40RGN-AWU | 5RK40RA-AWU | |
| 1/12 60 | 5IK60RGU-AWU | 5IK60RA-AWU | 5RK60RGU-AWU | 5RK60RA-AWU | |

◆ Single-Phase 220/230 VAC

| Output Power HP W | Induction Motors | | Reversible Motors | | Speed Controller |
|----------------------|---------------------|--------------------|---------------------|--------------------|------------------|
| | Pinion Shaft Type | Round Shaft Type | Pinion Shaft Type | Round Shaft Type | |
| 1/125 6 | 2IK6RGN-CWE | 2IK6RA-CWE | 2RK6RGN-CWE | 2RK6RA-CWE | ES02 |
| 1/50 15 | 3IK15RGN-CWE | 3IK15RA-CWE | 3RK15RGN-CWE | 3RK15RA-CWE | |
| 1/30 25 | 4IK25RGN-CWE | 4IK25RA-CWE | 4RK25RGN-CWE | 4RK25RA-CWE | |
| 1/19 40 | 5IK40RGN-CWE | 5IK40RA-CWE | 5RK40RGN-CWE | 5RK40RA-CWE | |
| 1/12 60 | 5IK60RGU-CWE | 5IK60RA-CWE | 5RK60RGU-CWE | 5RK60RA-CWE | |

● Gearheads for World K Series (Sold Separately)

◆ Parallel

| Gearhead Model | Gear Ratio |
|------------------------------------|--------------|
| 2GN□KA | 3~180 |
| 2GN10XK (Decimal Gearhead) | |
| 3GN□KA | 3~180 |
| 3GN10XK (Decimal Gearhead) | |
| 4GN□KA | 3~180 |
| 4GN10XK (Decimal Gearhead) | |
| 5GN□KA | 3~180 |
| 5GN10XK (Decimal Gearhead) | |
| 5GU□KA | 3~180 |
| 5GU10XKB (Decimal Gearhead) | |

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

◆ Right-Angle

| Type | Gearhead Model | Gear Ratio |
|--------------|----------------|----------------|
| Hollow Shaft | 4GN□RH | 3.6~180 |
| | 5GN□RH | |
| | 5GU□RH | |
| Solid Shaft | 4GN□RAA | 3.6~180 |
| | 5GN□RAA | 3~180 |
| | 5GU□RAA | |

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

Product Number Code

V Series Speed Control Motors

V S I 4 25 A - 30 U

| | |
|---|--|
| ① | V Series |
| ② | Speed Control Motor |
| ③ | I: Induction Motor R: Reversible Motor |
| ④ | Motor Frame Size |
| ⑤ | Output Power (W) Example 25 : 25 W |
| ⑥ | Voltage A: Single-Phase 100/110/115 VAC C: Single-Phase 200/220/230 VAC |
| ⑦ | Gear Ratio Example 30 : Gear ratio of 30:1 |
| ⑧ | With Capacitor for U: Single-Phase 110-115 VAC E: Single-Phase 220-230 VAC |

Product Line

V Series Speed Control Motors (Combination Type)

Single-Phase 110/115 VAC

| Output Power | | Induction Motors | Reversible Motors | Speed Controller |
|--------------|----|-------------------|-------------------|------------------|
| HP | W | | | |
| 1/125 | 6 | VSI206A-□U | VSR206A-□U | ES01 |
| 1/50 | 15 | VSI315A-□U | VSR315A-□U | |
| 1/30 | 25 | VSI425A-□U | VSR425A-□U | |
| 1/19 | 40 | VSI540A-□U | VSR540A-□U | |
| 1/12 | 60 | VSI560A-□U | VSR560A-□U | |
| 1/8 | 90 | VSI590A-□U | VSR590A-□U | |

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

Single-Phase 220/230 VAC

| Output Power | | Induction Motors | Reversible Motors | Speed Controller |
|--------------|----|-------------------|-------------------|------------------|
| HP | W | | | |
| 1/125 | 6 | VSI206C-□E | VSR206C-□E | ES02 |
| 1/50 | 15 | VSI315C-□E | VSR315C-□E | |
| 1/30 | 25 | VSI425C-□E | VSR425C-□E | |
| 1/19 | 40 | VSI540C-□E | VSR540C-□E | |
| 1/12 | 60 | VSI560C-□E | VSR560C-□E | |
| 1/8 | 90 | VSI590C-□E | VSR590C-□E | |

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

■ Specifications of Applicable Motors

● World K Series Induction Motors – Continuous Rating

◆ Single-Phase 110/115 VAC Applicable Speed Controller: ES01



| Model | | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor |
|-------------------|------------------|----------------------|----|--------------------------------------|-----------|--------------|--------------------|-----|----------|-----|-----------------|------------|---------|-------------------|-----------|
| Pinion Shaft Type | Round Shaft Type | HP | W | VAC | Hz | r/min | 1200 r/min | | 90 r/min | | oz-in | mN·m | A | W | μF |
| (ZP) 2IK6RGN-AWU | 2IK6RA-AWU | 1/125 | 6 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 7.1 | 50 | 4.9 | 35 | 5.6 | 40 | 0.28 | 29 | 2.5 |
| (TP) 3IK15RGN-AWU | 3IK15RA-AWU | 1/50 | 15 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 17.7 | 125 | 5.9 | 42 | 9.2 | 65 | 0.48 | 46 | 4.5 |
| (TP) 4IK25RGN-AWU | 4IK25RA-AWU | 1/30 | 25 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 26 | 185 | 7.1 | 50 | 17.0 | 120 | 0.75 | 58 69 | 6.5 |
| (TP) 5IK40RGN-AWU | 5IK40RA-AWU | 1/19 | 40 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 31 | 225 | 9.5 | 67 | 25 28 | 180 200 | 1.1 | 107 | 9 |
| (TP) 5IK60RGU-AWU | 5IK60RA-AWU | 1/12 | 60 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 69 | 490 | 29 | 210 | 45 | 320 | 2 | 180 | 18 |

(ZP): These motors are impedance protected.

(TP): These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

* The speed range is under no load conditions.

◆ Single-Phase 220/230 VAC Applicable Speed Controller: ES02



| Model | | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor | | | |
|-------------------|------------------|----------------------|----|------------------|-----------|--------------|--------------------|-----|----------|-----|-----------------|------|---------|-------------------|-----------|-----|------|-----|
| Pinion Shaft Type | Round Shaft Type | HP | W | VAC | Hz | r/min | 1200 r/min | | 90 r/min | | oz-in | mN·m | A | W | μF | | | |
| (ZP) 2IK6RGN-CWE | 2IK6RA-CWE | 1/125 | 6 | Single-Phase 220 | 50 | 90~1400 | 5.9 | 42 | 4.5 | 32 | 4.9 | 35 | 0.14 | 28 | 0.6 | | | |
| | | | | Single-Phase 230 | 50 | 90~1400 | 6.5 | 46 | | | 5.6 | 40 | | 29 | | | | |
| | | | | | 60 | 90~1600 | 7.1 | 50 | | | | | | | | | | |
| (TP) 3IK15RGN-CWE | 3IK15RA-CWE | 1/50 | 15 | Single-Phase 220 | 50 | 90~1400 | 15.6 | 110 | 5.3 | 38 | 9.2 | 65 | 0.23 | 43 | 1 | | | |
| | | | | Single-Phase 230 | 50 | 90~1400 | 16.3 | 115 | | | 10.6 | 75 | | 44 | | | | |
| | | | | | 60 | 90~1600 | 17.7 | 125 | | | 9.2 | 65 | | 47 | | | | |
| | | | | | 60 | 90~1600 | 17.7 | 125 | | | | | | | | | | |
| (TP) 4IK25RGN-CWE | 4IK25RA-CWE | 1/30 | 25 | Single-Phase 220 | 50 | 90~1400 | 26 | 190 | 7.1 | 50 | 15.6 | 110 | 0.34 | 63 | 1.5 | | | |
| | | | | Single-Phase 230 | 50 | 90~1400 | 28 | 200 | | | 17.0 | 120 | | 67 | | | | |
| | | | | | 60 | 90~1600 | 25 | 180 | | | | | | 63 | | | | |
| | | | | | 60 | 90~1600 | 25 | 180 | | | | | | 69 | | | | |
| (TP) 5IK40RGN-CWE | 5IK40RA-CWE | 1/19 | 40 | Single-Phase 220 | 50 | 90~1400 | 42 | 300 | 10.6 | 75 | 26 | 190 | 0.55 | 96 | 2.3 | | | |
| | | | | Single-Phase 230 | 50 | 90~1400 | 45 | 320 | | | 9.9 | 70 | | 28 | | 200 | 104 | |
| | | | | | 60 | 90~1600 | 36 | 260 | | | | | | | | | 99 | |
| | | | | | 60 | 90~1600 | 36 | 260 | | | | | | | | | 105 | |
| (TP) 5IK60RGU-CWE | 5IK60RA-CWE | 1/12 | 60 | Single-Phase 220 | 50 | 90~1400 | 65 | 460 | 28 | 200 | 45 | 320 | 0.84 | 155 | 4 | | | |
| | | | | Single-Phase 230 | 50 | 90~1400 | 69 | 490 | | | 30 | 215 | | 0.89 | | 175 | | |
| | | | | | 60 | 90~1600 | 24 | 170 | | | | | | | | | 0.85 | 158 |
| | | | | | 60 | 90~1600 | 69 | 490 | | | 25 | 180 | | | | | 0.89 | 172 |

(ZP): These motors are impedance protected.

(TP): These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

* The speed range is under no load conditions.

● World K Series Reversible Motors – 30-Minute Rating

◆ Single-Phase 110/115 VAC Applicable Speed Controller: ES01



| Model | | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | Starting Torque | | Current | Power Consumption | Capacitor | | |
|-------------------|------------------|----------------------|----|------------------|-----------|--------------|--------------------|----------|-----------------|------|---------|-------------------|-----------|-----|-----|
| Pinion Shaft Type | Round Shaft Type | HP | W | VAC | Hz | r/min | 1200 r/min | 90 r/min | oz-in | mN-m | A | W | μF | | |
| ⓈP 2RK6RGN-AWU | 2RK6RA-AWU | 1/125 | 6 | Single-Phase 110 | 60 | 90~1600 | 7.1 | 50 | 7.1 | 50 | 6.3 | 45 | 0.32 | 32 | 3.5 |
| | | | | Single-Phase 115 | | | | | | | | | | | |
| ⓈP 3RK15RGN-AWU | 3RK15RA-AWU | 1/50 | 15 | Single-Phase 110 | 60 | 90~1600 | 17.7 | 125 | 12 | 85 | 14.2 | 100 | 0.6 | 59 | 6 |
| | | | | Single-Phase 115 | | | | | | | | | | | |
| ⓈP 4RK25RGN-AWU | 4RK25RA-AWU | 1/30 | 25 | Single-Phase 110 | 60 | 90~1600 | 29 | 205 | 15.6 | 110 | 19.8 | 140 | 0.95 | 90 | 8 |
| | | | | Single-Phase 115 | | | | | | | | | | | |
| ⓈP 5RK40RGN-AWU | 5RK40RA-AWU | 1/19 | 40 | Single-Phase 110 | 60 | 90~1600 | 45 | 320 | 22 | 155 | 34 | 240 | 1.4 | 138 | 12 |
| | | | | Single-Phase 115 | | | | | | | 36 | 260 | | | |
| ⓈP 5RK60RGU-AWU | 5RK60RA-AWU | 1/12 | 60 | Single-Phase 110 | 60 | 90~1600 | 69 | 490 | 38 | 270 | 53 | 380 | 2.2 | 201 | 20 |
| | | | | Single-Phase 115 | | | | | | | | | | | |

ⓈP: These motors are impedance protected.

ⓈP: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

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

* The speed range is under no load conditions.

◆ Single-Phase 220/230 VAC Applicable Speed Controller: ES02



| Model | | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | Starting Torque | | Current | Power Consumption | Capacitor | | | | | | | | |
|-------------------|------------------|----------------------|------|------------------|------------------|------------------|--------------------|----------|-----------------|------------------|---------|-------------------|-----------|-----|-----|-----|----|-----|------|-----|-----|
| Pinion Shaft Type | Round Shaft Type | HP | W | VAC | Hz | r/min | 1200 r/min | 90 r/min | oz-in | mN-m | A | W | μF | | | | | | | | |
| ⓈP 2RK6RGN-CWE | 2RK6RA-CWE | 1/125 | 6 | Single-Phase 220 | 50 | 90~1400 | 6.3 | 45 | 7.1 | 50 | 0.15 | 33 | 0.8 | | | | | | | | |
| | | | | | 60 | 90~1600 | | | | | | | | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 7.1 | 50 | 0.16 | | | | | | | | | | | |
| | | | | | | 60 | 90~1600 | | | | | | | | | | | | | | |
| | | | | | | Single-Phase 220 | 50 | 90~1400 | 19.8 | 140 | 0.44 | | | 88 | 2 | | | | | | |
| | | | | | | | 60 | 90~1600 | | | | | | | | | | | | | |
| ⓈP 3RK15RGN-CWE | 3RK15RA-CWE | 1/50 | 15 | Single-Phase 220 | 50 | 90~1400 | 17.7 | 125 | 12.3 | 87 | 14.2 | 100 | 0.29 | 59 | 1.5 | | | | | | |
| | | | | | 60 | 90~1600 | | | | | | | | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 29 | 205 | 16.3 | 115 | 19.8 | 140 | | | | | | | | |
| | | | | | | 60 | 90~1600 | | | | | | | | | | | | | | |
| | | | | | | ⓈP 4RK25RGN-CWE | 4RK25RA-CWE | 1/30 | 25 | Single-Phase 220 | 50 | 90~1400 | 45 | 320 | 25 | 180 | 38 | 270 | 0.72 | 133 | 3.5 |
| | | | | | | | | | | | 60 | 90~1600 | | | | | | | | | |
| Single-Phase 230 | 50 | 90~1400 | 24 | 170 | 36 | | | | | | 260 | | | | | | | | | | |
| | 60 | 90~1600 | | | | | | | | | | | | | | | | | | | |
| | ⓈP 5RK40RGN-CWE | 5RK40RA-CWE | 1/19 | 40 | Single-Phase 220 | | | | | | 50 | 90~1400 | 69 | 490 | 39 | 280 | 59 | 420 | 1.0 | 185 | |
| | | | | | | | | | | | 60 | 90~1600 | | | | | 53 | 380 | | | |
| Single-Phase 230 | | | | | | 50 | 90~1400 | 65 | 460 | 1.0 | 188 | | | | | | | | | | |
| | | | | | | 60 | 90~1600 | | | | | 53 | 380 | 1.1 | 202 | | | | | | |

ⓈP: These motors are impedance protected.

ⓈP: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

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

* The speed range is under no load conditions.

● **V Series Induction Motors – Continuous Rating**

◆ **Single-Phase 110/115 VAC Applicable Speed Controller: ES01**



| Model | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor | |
|------------------|----------------------|-------|---------|--------------------------------------|--------------|--------------------|----------|-------|-------|-----------------|-----------|------------|-------------------|-----------|-------|
| | HP | W | | | | 1200 r/min | 90 r/min | oz-in | mN-m | oz-in | mN-m | | | | oz-in |
| Combination Type | | HP | W | VAC | Hz | r/min | oz-in | mN-m | oz-in | mN-m | oz-in | mN-m | A | W | μF |
| Ⓢ | VSI206A-□U | 1/125 | 6 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 7.1 | 50 | 4.9 | 35 | 5.6 | 40 | 0.28 | 29 | 2.5 |
| Ⓢ | VSI315A-□U | 1/50 | 15 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 17.7 | 125 | 5.9 | 42 | 9.2 | 65 | 0.48 | 46 | 4.5 |
| Ⓢ | VSI425A-□U | 1/30 | 25 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 26 | 185 | 7.1 | 50 | 17 | 120 | 0.75 | 58 69 | 6.5 |
| Ⓢ | VSI540A-□U | 1/19 | 40 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 31 | 225 | 9.5 | 67 | 25 2.4 | 180 200 | 1.1 | 107 | 9 |
| Ⓢ | VSI560A-□U | 1/12 | 60 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 69 | 490 | 29 | 210 | 45 | 320 | 2 | 180 | 18 |
| Ⓢ | VSI590A-□U | 1/8 | 90 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 103 | 730 | 29 | 210 | 58 63 | 410 450 | 2.6 | 240 | 20 |

Ⓢ: These motors are impedance protected.

Ⓢ: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

● Enter the gear ratio in the box (□) within the model name. The values for each item is for the motor only.

* The speed range is under no load conditions.

◆ **Single-Phase 220/230 VAC Applicable Speed Controller: ES02**



| Model | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor | | |
|------------------|----------------------|-------|---------|------------------|------------------|--------------------|----------|-------|-------|-----------------|-------|---------|------------------------------|--------------------------|-------|------|
| | HP | W | | | | 1200 r/min | 90 r/min | oz-in | mN-m | oz-in | mN-m | | | | oz-in | mN-m |
| Combination Type | | HP | W | VAC | Hz | r/min | oz-in | mN-m | oz-in | mN-m | oz-in | mN-m | A | W | μF | |
| Ⓢ | VSI206C-□E | 1/125 | 6 | Single-Phase 220 | 50 | 90~1400 | 5.9 | 42 | 4.5 | 32 | 4.9 | 35 | 0.14 | 28 | 0.6 | |
| | | | | | 60 | 90~1600 | 7.1 | 50 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 6.5 | | | | | | | | 46 |
| | | | | | | 60 | 90~1600 | 7.1 | | | | | | | | 50 |
| Ⓢ | VSI315C-□E | 1/50 | 15 | Single-Phase 220 | 50 | 90~1400 | 15.6 | 110 | 5.3 | 38 | 9.2 | 65 | 0.23 | 43 46 44 | 1 | |
| | | | | | 60 | 90~1600 | 17.7 | 125 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 16.3 | | | | | | | | 115 |
| | | | | | | 60 | 90~1600 | 17.7 | | | | | | | | 125 |
| Ⓢ | VSI425C-□E | 1/30 | 25 | Single-Phase 220 | 50 | 90~1400 | 26 | 190 | 7.1 | 50 | 15.6 | 110 | 0.34 | 63 67 63 | 1.5 | |
| | | | | | 60 | 90~1600 | 28 | 200 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 28 | | | | | | | | 200 |
| | | | | | | 60 | 90~1600 | 25 | | | | | | | | 180 |
| Ⓢ | VSI540C-□E | 1/19 | 40 | Single-Phase 220 | 50 | 90~1400 | 42 | 300 | 10.6 | 75 | 26 | 190 | 0.55 | 96 104 99 | 2.3 | |
| | | | | | 60 | 90~1600 | 39 | 280 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 45 | | | | | | | | 320 |
| | | | | | | 60 | 90~1600 | 36 | | | | | | | | 260 |
| Ⓢ | VSI560C-□E | 1/12 | 60 | Single-Phase 220 | 50 | 90~1400 | 65 | 460 | 28.4 | 200 | 45 | 320 | 0.84 0.89 0.85 0.89 | 155 175 158 172 | 4 | |
| | | | | | 60 | 90~1600 | 69 | 490 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 69 | | | | | | | | 490 |
| | | | | | | 60 | 90~1600 | 25 | | | | | | | | 180 |
| Ⓢ | VSI590C-□E | 1/8 | 90 | Single-Phase 220 | 50 | 90~1400 | 102 | 720 | 36 | 260 | 63 | 450 | 1.2 | 209 232 211 | 6 | |
| | | | | | 60 | 90~1600 | 103 | 730 | | | | | | | | |
| | | | | | Single-Phase 230 | 50 | 90~1400 | 103 | | | | | | | | 730 |
| | | | | | | 60 | 90~1600 | 39 | | | | | | | | 280 |

Ⓢ: These motors are impedance protected.

Ⓢ: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

● Enter the gear ratio in the box (□) within the model name. The values for each item is for the motor only.

* The speed range is under no load conditions.

● V Series Reversible Motors – 30-Minute Rating

◆ Single-Phase 110/115 VAC Applicable Speed Controller: ES01



| Model | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor | |
|------------------|----------------------|-------|---------|--------------------------------------|--------------|--------------------|----------|-------|-------|-----------------|----------|------------|-------------------|-----------|-----|
| | HP | W | | | | 1200 r/min | 90 r/min | oz-in | mN-m | oz-in | mN-m | | | | |
| Combination Type | | HP | W | VAC | Hz | r/min | oz-in | mN-m | oz-in | mN-m | A | W | μF | | |
| Ⓟ | VSR206A-□U | 1/125 | 6 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 7.1 | 50 | 7.1 | 50 | 6.3 | 45 | 0.32 | 32 | 3.5 |
| Ⓣ | VSR315A-□U | 1/50 | 15 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 17.7 | 125 | 12 | 85 | 14.2 | 100 | 0.6 | 59 | 6 |
| Ⓣ | VSR425A-□U | 1/30 | 25 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 29 | 205 | 15 | 110 | 19.8 | 140 | 0.95 | 90 | 8 |
| Ⓣ | VSR540A-□U | 1/19 | 40 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 45 | 320 | 22 | 155 | 34 36 | 240 260 | 1.4 | 138 | 12 |
| Ⓣ | VSR560A-□U | 1/12 | 60 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 69 | 490 | 38 | 270 | 53 | 380 | 2.2 | 201 | 20 |
| Ⓣ | VSR590A-□U | 1/8 | 90 | Single-Phase 110 Single-Phase 115 | 60 | 90~1600 | 103 | 730 | 45 | 320 | 83 | 590 | 3 | 272 | 30 |

Ⓟ: These motors are impedance protected.

Ⓣ: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

● Enter the gear ratio in the box (□) within the model name. The values for each item is for the motor only.

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

* The speed range is under no load conditions.

◆ Single-Phase 220/230 VAC Applicable Speed Controller: ES02



| Model | Maximum Output Power | | Voltage | Frequency | Speed Range* | Permissible Torque | | | | Starting Torque | | Current | Power Consumption | Capacitor | | | | | |
|------------------|----------------------|-------|---------|------------------|------------------|--------------------|----------|---------|-------|-----------------|------|---------|-------------------|-----------|-----|------|---------|------|-----|
| | HP | W | | | | 1200 r/min | 90 r/min | oz-in | mN-m | oz-in | mN-m | | | | | | | | |
| Combination Type | | HP | W | VAC | Hz | r/min | oz-in | mN-m | oz-in | mN-m | A | W | μF | | | | | | |
| Ⓟ | VSR206C-□E | 1/125 | 6 | Single-Phase 220 | 50 | 90~1400 | 6.3 | 45 | 7.1 | 50 | 7.1 | 50 | 0.15 | 33 | 0.8 | | | | |
| | | | | | 60 | 90~1600 | 7.1 | 50 | | | 6.3 | 45 | | | | 0.16 | | | |
| | | | | | Single-Phase 230 | | 50 | 90~1400 | | | 7.1 | 50 | | | | 7.1 | 50 | 0.16 | |
| | | | | | 60 | 90~1600 | 7.1 | 50 | | | 6.3 | 45 | | | | 0.16 | | | |
| Ⓣ | VSR315C-□E | 1/50 | 15 | Single-Phase 220 | 50 | 90~1400 | 17.7 | 125 | 12.3 | 87 | 14.2 | 100 | 0.29 | 59 | 1.5 | | | | |
| | | | | | 60 | 90~1600 | | | | | | | | | | | | | |
| | | | | | Single-Phase 230 | | | | | | | | | | | 50 | 90~1400 | | |
| | | | | | 60 | 90~1600 | | | | | | | | | | | | | |
| Ⓣ | VSR425C-□E | 1/30 | 25 | Single-Phase 220 | 50 | 90~1400 | 29 | 205 | 16.3 | 115 | 19.8 | 140 | 0.44 | 88 | 2 | | | | |
| | | | | | 60 | 90~1600 | | | | | 22 | 155 | | | | | | | |
| | | | | | Single-Phase 230 | | | | | | 50 | 90~1400 | | | | 19.8 | 140 | | |
| | | | | | 60 | 90~1600 | | | | | | | | | | | | | |
| Ⓣ | VSR540C-□E | 1/19 | 40 | Single-Phase 220 | 50 | 90~1400 | 45 | 320 | 25 | 180 | 38 | 270 | 0.72 | 133 | 3.5 | | | | |
| | | | | | 60 | 90~1600 | | | | | 24 | 170 | | | | 36 | 260 | | |
| | | | | | Single-Phase 230 | | | | | | 50 | 90~1400 | | | | 24 | 170 | 38 | 270 |
| | | | | | 60 | 90~1600 | | | | | 36 | 260 | | | | | | | |
| Ⓣ | VSR560C-□E | 1/12 | 60 | Single-Phase 220 | 50 | 90~1400 | 69 | 490 | 39 | 280 | 59 | 420 | 1.0 | 185 | 5 | | | | |
| | | | | | 60 | 90~1600 | | | | | 53 | 380 | | | | 198 | | | |
| | | | | | Single-Phase 230 | | | | | | 50 | 90~1400 | | | | 53 | 460 | 1.0 | 188 |
| | | | | | 60 | 90~1600 | | | | | 53 | 380 | | | | 1.1 | 202 | | |
| Ⓣ | VSR590C-□E | 1/8 | 90 | Single-Phase 220 | 50 | 90~1400 | 95 | 670 | 51 | 360 | 85 | 600 | 1.3 | 240 | 7 | | | | |
| | | | | | 60 | 90~1600 | 103 | 730 | | | 83 | 590 | | | | 1.4 | 260 | | |
| | | | | | Single-Phase 230 | | 50 | 90~1400 | | | 85 | 600 | | | | 1.3 | 240 | | |
| | | | | | 60 | 90~1600 | 103 | 730 | | | 49 | 350 | | | | 83 | 590 | 1.4 | 262 |

Ⓟ: These motors are impedance protected.

Ⓣ: These motors contain a built-in thermal protector. If a motor overheats for any reason, the thermal protector is opened and the motor stops. When the motor temperature drops, the thermal protector closes and the motor restarts. Be sure to turn the motor off before inspecting.

● Enter the gear ratio in the box (□) within the model name. The values for each item is for the motor only.

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

* The speed range is under no load conditions.

General Specifications of Speed Control Motors

| Item | Specifications |
|-------------------------------|--|
| Insulation Resistance | 100 MΩ or more when 500 VDC is applied between the windings and the frame. |
| Dielectric Strength | Sufficient to withstand 1.5 kV at 50 Hz and 60 Hz applied between the windings and the frame for 1 minute. |
| Temperature Rise | 144°F (80°C) or less measured by the resistance change method after rated motor operation with a gearhead or equivalent heat radiation plate connected.* |
| Insulation Class | Class B [266°F (130°C)] |
| Overheating Protection Device | 6 W type is impedance protected. The other types contain a built-in thermal protector (automatic return type). Open: 266°F±9°F (130°C±5°C) Close: 179.6°F±27°F (82°C±15°C) |
| Ambient Temperature Range | 14°F~104°F (-10°C~+40°C) (nonfreezing) |
| Ambient Humidity | 85% maximum (noncondensing) |
| Degree of Protection | IP20 (World K Series 60W: IP40) |

* Heat radiation plate (Material: Aluminum)

| Type (output) | Size inch (mm) | Thickness inch (mm) |
|---------------|---------------------|---------------------|
| 6 W Type | 4.53×4.53 (115×115) | 0.20 (5) |
| 15 W Type | 4.92×4.92 (125×125) | |
| 25 W Type | 5.31×5.31 (135×135) | |
| 40 W Type | 6.50×6.50 (165×165) | |
| 60 W Type | 7.87×7.87 (200×200) | |

Speed Range when Gearhead is Attached

World K 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 |
|------------|------|-----|-----|-----|-----|-----|-----|------|-----|----|-----|----|-----|-----|-----|-----|----|-----|------|-----|-----|
| High Speed | 60Hz | 533 | 444 | 320 | 266 | 213 | 177 | 128 | 106 | 88 | 64 | 53 | 44 | 32 | 26 | 21 | 17 | 16 | 13 | 10 | 8.8 |
| | 50Hz | 466 | 388 | 280 | 233 | 186 | 155 | 112 | 93 | 77 | 56 | 46 | 38 | 28 | 23 | 18 | 15 | 14 | 11 | 9 | 7 |
| 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 |

Unit=r/min

V Series

| Gear Ratio | | 5 | 6 | 9 | 15 | 18 | 30 | 36 | 60 | 90 | 120 | 180 | 300 | 360 |
|------------|------|-----|-----|-----|-----|----|----|-----|-----|----|------|-----|-----|------|
| High Speed | 60Hz | 320 | 266 | 177 | 106 | 88 | 53 | 44 | 26 | 17 | 13 | 8.8 | 5.3 | 4.4 |
| | 50Hz | 280 | 233 | 155 | 93 | 77 | 46 | 38 | 23 | 15 | 11 | 7 | 4 | 3 |
| Low Speed | | 18 | 15 | 10 | 6 | 5 | 3 | 2.5 | 1.5 | 1 | 0.75 | 0.5 | 0.3 | 0.25 |

Unit=r/min

* The speed range is under no load conditions.

Permissible Torque when a Gearhead is Attached

- Decimal gearhead is not available for V Series.
- 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; a white background indicates rotation in the opposite direction.

The permissible torque with decimal gearheads are as follows.

2GN□KA/2GN10XK 26 lb-in/3 N·m **3GN□KA/3GN10XK** 44 lb-in/5 N·m
4GN□KA/4GN10XK 70 lb-in/8 N·m (Gear Ratio 25~36 53 lb-in/6 N·m)
5GN□KA/5GN10XK 88 lb-in/10 N·m **5GU□KA/5GU10XKB** 177 lb-in/20 N·m

World K Series Induction Motors – Continuous Rating

Single-Phase 115 VAC Applicable Speed Controller: ES01

Unit=Upper Values: lb-in/Lower Values: N·m

| 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-AWU /2GN□KA | 1200 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| | 90 r/min | 0.75 0.085 | 0.88 0.1 | 1.23 0.14 | 1.50 0.17 | 1.85 0.21 | 2.3 0.26 | 3.0 0.35 | 3.8 0.43 | 4.5 0.51 | 5.6 0.64 | 6.8 0.77 | 8.1 0.92 | 10.6 1.2 | 12.3 1.4 | 15.0 1.7 | 18.5 2.1 | 20 2.3 | 24 2.8 | 26 3 | 26 3 |
| 3IK15RGN-AWU /3GN□KA | 1200 r/min | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.7 0.76 | 8.0 0.91 | 11.5 1.3 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 23 2.7 | 29 3.3 | 36 4.1 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| | 90 r/min | 0.88 0.1 | 1.06 0.12 | 1.50 0.17 | 1.77 0.2 | 2.3 0.26 | 2.7 0.31 | 3.8 0.43 | 4.5 0.51 | 5.3 0.61 | 6.8 0.77 | 8.1 0.92 | 9.7 1.1 | 12.3 1.4 | 15.0 1.7 | 18.5 2.1 | 22 2.5 | 24 2.8 | 29 3.3 | 37 4.2 | 44 5 |
| 4IK25RGN-AWU /4GN□KA | 1200 r/min | 3.9 0.45 | 4.7 0.54 | 6.6 0.75 | 7.9 0.9 | 9.7 1.1 | 11.5 1.3 | 16.8 1.9 | 19.4 2.2 | 23 2.7 | 30 3.4 | 36 4.1 | 43 4.9 | 53 6.1 | 64 7.3 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | 90 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 29 3.3 | 35 4 | 44 5 | 52 5.9 |
| 5IK40RGN-AWU /5GN□KA | 1200 r/min | 4.8 0.55 | 5.8 0.66 | 8.0 0.91 | 9.7 1.1 | 12.3 1.4 | 14.1 1.6 | 20 2.3 | 23 2.7 | 29 3.3 | 36 4.1 | 43 4.9 | 52 5.9 | 65 7.4 | 78 8.9 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 1.41 0.16 | 1.77 0.2 | 2.3 0.27 | 2.9 0.33 | 3.6 0.41 | 4.3 0.49 | 6.0 0.68 | 7.1 0.81 | 8.6 0.98 | 10.6 1.2 | 13.2 1.5 | 15.9 1.8 | 19.4 2.2 | 23 2.7 | 29 3.3 | 35 4 | 38 4.4 | 46 5.3 | 58 6.6 | 70 8 |
| 5IK60RGU-AWU /5GU□KA | 1200 r/min | 10.6 1.2 | 12.3 1.4 | 17.7 2 | 21 2.4 | 26 3 | 31 3.6 | 39 4.5 | 47 5.4 | 56 6.4 | 71 8.1 | 85 9.7 | 102 11.6 | 143 16.2 | 171 19.4 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 |
| | 90 r/min | 4.5 0.51 | 5.3 0.61 | 7.5 0.85 | 8.8 1 | 11.5 1.3 | 13.2 1.5 | 16.8 1.9 | 20 2.3 | 24 2.8 | 30 3.5 | 37 4.2 | 44 5 | 61 6.9 | 73 8.3 | 82 9.3 | 99 11.2 | 109 12.4 | 131 14.9 | 164 18.6 | 177 20 |

◆ Single-Phase 220/230 VAC Applicable Speed Controller: ES02

Unit=Upper Values: lb-in/Lower Values: N-m

| 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-CWE /2GN□KA | 1200 r/min | 230 VAC 50 Hz | 0.97 0.11 | 1.15 0.13 | 1.68 0.19 | 1.94 0.22 | 2.4 0.28 | 3.0 0.34 | 4.1 0.47 | 4.9 0.56 | 5.9 0.67 | 7.4 0.84 | 8.8 1 | 10.6 1.2 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 23 2.7 | 26 3 | 26 3 | 26 3 | 26 3 | |
| | | 220 VAC 60 Hz 230 VAC 60 Hz | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| | 90 r/min | | 0.69 0.078 | 0.82 0.093 | 1.15 0.13 | 1.41 0.16 | 1.68 0.19 | 2.0 0.23 | 2.8 0.32 | 3.4 0.39 | 4.1 0.47 | 5.1 0.58 | 6.1 0.7 | 7.4 0.84 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 18.5 2.1 | 22 2.5 | 26 3 | 26 3 | 26 3 |
| | 1200 r/min | 230 VAC 50 Hz | 2.4 0.28 | 3.0 0.34 | 4.1 0.47 | 4.9 0.56 | 6.1 0.7 | 7.4 0.84 | 10.6 1.2 | 12.3 1.4 | 15.0 1.7 | 18.5 2.1 | 22 2.5 | 26 3 | 33 3.8 | 40 4.6 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| 230 VAC 60 Hz | | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.7 0.76 | 8.0 0.91 | 11.5 1.3 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 23 2.7 | 29 3.3 | 36 4.1 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | |
| 90 r/min | | 0.81 0.092 | 0.97 0.11 | 1.32 0.15 | 1.59 0.18 | 2.0 0.23 | 2.4 0.28 | 3.3 0.38 | 4.0 0.46 | 4.8 0.55 | 6.1 0.69 | 7.3 0.83 | 8.8 1 | 11.5 1.3 | 13.2 1.5 | 16.8 1.9 | 20 2.3 | 22 2.5 | 26 3 | 33 3.8 | 39 4.5 | | |
| 4IK25RGN-CWE /4GN□KA | 1200 r/min | 220 VAC 60 Hz | 4.0 0.46 | 4.8 0.55 | 6.8 0.77 | 8.1 0.92 | 10.6 1.2 | 12.3 1.4 | 16.8 1.9 | 20 2.3 | 24 2.8 | 30 3.5 | 37 4.2 | 44 5 | 55 6.3 | 66 7.5 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | | 230 VAC 50 Hz | 4.3 0.49 | 5.1 0.58 | 7.1 0.81 | 8.5 0.97 | 10.6 1.2 | 13.2 1.5 | 17.7 2 | 21 2.4 | 25 2.9 | 32 3.7 | 38 4.4 | 46 5.3 | 58 6.6 | 69 7.9 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | | 230 VAC 60 Hz | 3.8 0.44 | 4.6 0.52 | 6.4 0.73 | 7.6 0.87 | 9.7 1.1 | 11.5 1.3 | 15.9 1.8 | 19.4 2.2 | 23 2.6 | 29 3.3 | 34 3.9 | 41 4.7 | 52 5.9 | 62 7.1 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | 90 r/min | | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 29 3.3 | 35 4 | 44 5 | 52 5.9 | |
| 5IK40RGN-CWE /5GN□KA | 1200 r/min | 220 VAC 60 Hz | 6.0 0.68 | 7.2 0.82 | 9.7 1.1 | 12.3 1.4 | 15.0 1.7 | 17.7 2 | 24 2.8 | 30 3.4 | 36 4.1 | 45 5.1 | 53 6.1 | 65 7.4 | 81 9.2 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | | 230 VAC 50 Hz | 6.9 0.78 | 8.2 0.93 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 20 2.3 | 28 3.2 | 34 3.9 | 41 4.7 | 51 5.8 | 61 7 | 74 8.4 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | | 230 VAC 60 Hz | 5.5 0.63 | 6.7 0.76 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 23 2.6 | 28 3.2 | 33 3.8 | 41 4.7 | 50 5.7 | 60 6.8 | 76 8.6 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 220 VAC 60 Hz | 1.59 0.18 | 1.94 0.22 | 2.6 0.3 | 3.1 0.36 | 4.0 0.46 | 4.8 0.55 | 6.7 0.76 | 8.0 0.91 | 9.7 1.1 | 12.3 1.4 | 14.1 1.6 | 17.7 2 | 22 2.5 | 26 3 | 32 3.7 | 39 4.5 | 44 5 | 52 5.9 | 65 7.4 | 78 8.9 | |
| | | 230 VAC 50 Hz 230 VAC 60 Hz | 1.50 0.17 | 1.77 0.2 | 2.4 0.28 | 3.0 0.34 | 3.8 0.43 | 4.5 0.51 | 6.2 0.71 | 7.5 0.85 | 8.8 1 | 11.5 1.3 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 24 2.8 | 30 3.5 | 37 4.2 | 40 4.6 | 48 5.5 | 61 6.9 | 73 8.3 | |
| 5IK60RGU-CWE /5GU□KA | 1200 r/min | 230 VAC 50 Hz 220 VAC 60 Hz 230 VAC 60 Hz | 10.6 1.2 | 12.3 1.4 | 17.7 2 | 21 2.4 | 26 3 | 31 3.6 | 39 4.5 | 47 5.4 | 56 6.4 | 71 8.1 | 85 9.7 | 102 11.6 | 143 16.2 | 171 19.4 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 | |
| | | 90 r/min | | 4.6 0.52 | 5.5 0.63 | 7.6 0.87 | 8.8 1 | 11.5 1.3 | 14.1 1.6 | 17.7 2 | 21 2.4 | 24 2.8 | 30 3.5 | 38 4.3 | 45 5.1 | 62 7.1 | 75 8.5 | 84 9.5 | 100 11.4 | 112 12.7 | 134 15.2 | 168 19 | 177 20 |
| | 90 r/min | 230 VAC 50 Hz | 3.6 0.41 | 4.4 0.5 | 6.1 0.69 | 7.3 0.83 | 8.8 1 | 10.6 1.2 | 14.1 1.6 | 16.8 1.9 | 19.4 2.2 | 24 2.8 | 30 3.4 | 35 4 | 49 5.6 | 59 6.7 | 66 7.5 | 79 9 | 88 10 | 106 12 | 132 15 | 160 18.1 | |
| | | 230 VAC 60 Hz | 3.8 0.44 | 4.6 0.52 | 6.4 0.73 | 7.6 0.87 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 17.7 2 | 21 2.4 | 26 3 | 31 3.6 | 38 4.3 | 52 5.9 | 62 7.1 | 70 8 | 84 9.6 | 93 10.6 | 112 12.7 | 140 15.9 | 169 19.1 | |

- 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; a white background indicates rotation in the opposite direction.

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

◆ **Single-Phase 115 VAC Applicable Speed Controller: ES01**

Unit=Upper Values: lb-in/Lower Values: N-m

| 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-AWU /2GN□KA | 1200 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| | 90 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| 3RK15RGN-AWU /3GN□KA | 1200 r/min | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.7 0.76 | 8.0 0.91 | 11.5 1.3 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 23 2.7 | 29 3.3 | 36 4.1 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| | 90 r/min | 1.85 0.21 | 2.2 0.25 | 3.0 0.34 | 3.6 0.41 | 4.6 0.52 | 5.4 0.62 | 7.6 0.86 | 8.8 1 | 10.6 1.2 | 14.1 1.6 | 16.8 1.9 | 19.4 2.2 | 24 2.8 | 30 3.4 | 37 4.2 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| 4RK25RGN-AWU /4GN□KA | 1200 r/min | 4.4 0.5 | 5.3 0.6 | 7.3 0.83 | 8.8 1 | 10.6 1.2 | 13.2 1.5 | 18.5 2.1 | 22 2.5 | 26 3 | 32 3.7 | 39 4.5 | 47 5.4 | 60 6.8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | 90 r/min | 2.3 0.27 | 2.8 0.32 | 3.9 0.45 | 4.6 0.53 | 5.9 0.67 | 7.0 0.8 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 17.7 2 | 21 2.4 | 25 2.9 | 31 3.6 | 38 4.4 | 47 5.4 | 57 6.5 | 64 7.3 | 70 8 | 70 8 | 70 8 |
| 5RK40RGN-AWU /5GN□KA | 1200 r/min | 6.9 0.78 | 8.2 0.93 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 20 2.3 | 28 3.2 | 34 3.9 | 41 4.7 | 51 5.8 | 61 7 | 74 8.4 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 3.3 0.38 | 3.9 0.45 | 5.5 0.63 | 6.6 0.75 | 8.3 0.94 | 9.7 1.1 | 14.1 1.6 | 16.8 1.9 | 20 2.3 | 24 2.8 | 30 3.4 | 36 4.1 | 45 5.1 | 53 6.1 | 68 7.7 | 81 9.2 | 88 10 | 88 10 | 88 10 | 88 10 |
| 5RK60RGU-AWU /5GU□KA | 1200 r/min | 10.6 1.2 | 12.3 1.4 | 17.7 2 | 21 2.4 | 26 3 | 31 3.6 | 39 4.5 | 47 5.4 | 56 6.4 | 71 8.1 | 85 9.7 | 102 11.6 | 143 16.2 | 171 19.4 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 |
| | 90 r/min | 5.8 0.66 | 6.9 0.79 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 17.7 2.0 | 22 2.5 | 26 3.0 | 30 3.5 | 39 4.5 | 46 5.3 | 56 6.4 | 78 8.9 | 94 10.7 | 105 11.9 | 126 14.3 | 140 15.9 | 169 19.1 | 177 20 | 177 20 |

◆ **Single-Phase 220/230 VAC Applicable Speed Controller: ES02**

Unit=Upper Values: lb-in/Lower Values: N-m

| 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-CWE /2GN□KA | 1200 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| | 90 r/min | 1.06 0.12 | 1.32 0.15 | 1.77 0.2 | 2.1 0.24 | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.4 0.73 | 8.0 0.91 | 9.7 1.1 | 11.5 1.3 | 15.0 1.7 | 17.7 2 | 22 2.5 | 26 3 | 26 3 | 26 3 | 26 3 | 26 3 |
| 3RK15RGN-CWE /3GN□KA | 1200 r/min | 2.6 0.3 | 3.1 0.36 | 4.5 0.51 | 5.3 0.61 | 6.7 0.76 | 8.0 0.91 | 11.5 1.3 | 13.2 1.5 | 15.9 1.8 | 20 2.3 | 23 2.7 | 29 3.3 | 36 4.1 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| | 90 r/min | 1.85 0.21 | 2.2 0.25 | 3.0 0.35 | 3.7 0.42 | 4.6 0.53 | 5.5 0.63 | 7.7 0.88 | 9.7 1.1 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 20 2.3 | 25 2.9 | 30 3.4 | 38 4.3 | 44 5 | 44 5 | 44 5 | 44 5 | 44 5 |
| 4RK25RGN-CWE /4GN□KA | 1200 r/min | 4.4 0.5 | 5.3 0.6 | 7.3 0.83 | 8.8 1 | 10.6 1.2 | 13.2 1.5 | 18.5 2.1 | 22 2.5 | 26 3 | 32 3.7 | 39 4.5 | 47 5.4 | 60 6.8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 | 70 8 |
| | 90 r/min | 2.4 0.28 | 3.0 0.34 | 4.1 0.47 | 4.9 0.56 | 6.1 0.7 | 7.4 0.84 | 10.6 1.2 | 12.3 1.4 | 15.0 1.7 | 18.5 2.1 | 22 2.5 | 26 3 | 33 3.8 | 40 4.6 | 50 5.7 | 60 6.8 | 67 7.6 | 70 8 | 70 8 | 70 8 |
| 5RK40RGN-CWE /5GN□KA | 1200 r/min | 6.9 0.78 | 8.2 0.93 | 11.5 1.3 | 14.1 1.6 | 16.8 1.9 | 20 2.3 | 28 3.2 | 34 3.9 | 41 4.7 | 51 5.8 | 61 7 | 74 8.4 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 3.6 0.41 | 4.4 0.5 | 6.1 0.69 | 7.3 0.83 | 8.8 1 | 10.6 1.2 | 15.0 1.7 | 18.5 2.1 | 22 2.5 | 27 3.1 | 32 3.7 | 39 4.5 | 49 5.6 | 59 6.7 | 74 8.4 | 88 10 | 88 10 | 88 10 | 88 10 | 88 10 |
| 5RK60RGU-CWE /5GU□KA | 1200 r/min | 10.6 1.2 | 12.3 1.4 | 17.7 2 | 21 2.4 | 26 3 | 31 3.6 | 39 4.5 | 47 5.4 | 56 6.4 | 71 8.1 | 85 9.7 | 102 11.6 | 143 16.2 | 171 19.4 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 | 177 20 |
| | 90 r/min | 6.0 0.68 | 7.2 0.82 | 9.7 1.1 | 12.3 1.4 | 15.0 1.7 | 17.7 2 | 23 2.6 | 27 3.1 | 32 3.7 | 40 4.6 | 48 5.5 | 59 6.7 | 81 9.2 | 98 11.1 | 109 12.4 | 131 14.9 | 146 16.5 | 175 19.8 | 177 20 | 177 20 |

- 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; a white background indicates rotation in the opposite direction.

● **V Series Induction Motors – Continuous Rating**

◆ **Single-Phase 115 VAC Applicable Speed Controller: ES01** Unit=Upper Values: lb-in/Lower Values: N·m

| Model Combination Type | Gear Ratio Speed | 5 | 6 | 9 | 15 | 18 | 30 | 36 | 60 | 90 | 120 | 180 | 300 | 360 |
|------------------------|------------------|--------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| VSI206A-□U | 1200 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| | 90 r/min | 1.41 0.16 | 1.68 0.19 | 2.4 0.28 | 4.1 0.47 | 5.0 0.57 | 7.9 0.9 | 9.7 1.1 | 15.9 1.8 | 23 2.7 | 31 3.6 | 45 5.1 | 53 6 | 53 6 |
| VSI315A-□U | 1200 r/min | 4.9 0.56 | 6.0 0.68 | 8.8 1.0 | 15.0 1.7 | 17.7 2.0 | 28 3.2 | 34 3.9 | 57 6.5 | 85 9.7 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 1.68 0.19 | 2.0 0.23 | 3.0 0.34 | 5.0 0.57 | 6.0 0.68 | 9.7 1.1 | 11.5 1.3 | 19.4 2.2 | 29 3.3 | 38 4.3 | 53 6.1 | 88 10 | 88 10 |
| VSI425A-□U | 1200 r/min | 7.3 0.83 | 8.8 1.0 | 13.2 1.5 | 22 2.5 | 26 3.0 | 42 4.8 | 50 5.7 | 84 9.5 | 126 14.3 | 141 16 | 141 16 | 141 16 | 141 16 |
| | 90 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 64 7.3 | 107 12.2 | 129 14.6 |
| VSI540A-□U | 1200 r/min | 8.8 1.0 | 10.6 1.2 | 15.9 1.8 | 26 3.0 | 31 3.6 | 51 5.8 | 61 7.0 | 102 11.6 | 153 17.4 | 193 21.9 | 260 30 | 260 30 | — |
| | 90 r/min | 2.6 0.3 | 3.1 0.36 | 4.7 0.54 | 7.9 0.9 | 9.7 1.1 | 15.0 1.7 | 18.5 2.1 | 30 3.5 | 46 5.2 | 57 6.5 | 86 9.8 | 144 16.3 | — |
| VSI560A-□U | 1200 r/min | 19.4 2.2 | 23 2.6 | 35 4.0 | 58 6.6 | 69 7.9 | 111 12.6 | 134 15.2 | 220 25.3 | 260 30 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 8.4 0.95 | 9.7 1.1 | 15.0 1.7 | 24 2.8 | 30 3.4 | 47 5.4 | 57 6.5 | 95 10.8 | 144 16.3 | 180 20.4 | 260 30 | 260 30 | — |
| VSI590A-□U | 1200 r/min | 29 3.3 | 34 3.9 | 52 5.9 | 87 9.9 | 100 11.3 | 166 18.8 | 200 22.6 | 330 37.7 | 350 40 | 350 40 | 350 40 | — | — |
| | 90 r/min | 8.4 0.95 | 9.7 1.1 | 15.0 1.7 | 24 2.8 | 29 3.3 | 47 5.4 | 57 6.5 | 95 10.8 | 135 15.3 | 180 20.4 | 270 30.6 | — | — |

Introduction

BX

FBI II

AXU

AXH

BHF

ES

US

Before Using a Speed Control System

Brushless DC Motor Systems

AC Input

DC Input

AC Motor Systems

◆ **Single-Phase 220/230 VAC Applicable Speed Controller: ES02**

Unit=Upper Values: lb-in/Lower Values: N-m

| Model Combination Type | | Gear Ratio Speed | 5 | 6 | 9 | 15 | 18 | 30 | 36 | 60 | 90 | 120 | 180 | 300 | 360 |
|------------------------|------------|---|----------------------------|----------------------------|----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|----------------------------|----------------------------|----------------------------|------------------------|-------------|
| VSI206C-□E | 1200 r/min | 230 VAC 50 Hz | 1.85 0.21 | 2.2 0.25 | 3.2 0.37 | 5.4 0.62 | 6.6 0.75 | 10.6 1.2 | 12.3 1.4 | 21 2.4 | 31 3.6 | 41 4.7 | 53 6 | 53 6 | 53 6 |
| | | 220 VAC 60 Hz | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| | | 230 VAC 60 Hz | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| | 90 r/min | 1.23 0.14 | 1.50 0.17 | 2.3 0.26 | 3.8 0.43 | 4.6 0.52 | 7.3 0.83 | 8.7 0.99 | 15.0 1.7 | 22 2.5 | 29 3.3 | 41 4.7 | 53 6 | 53 6 | 53 6 |
| VSI315C-□E | 1200 r/min | 230 VAC 50 Hz | 4.6 0.52 | 5.4 0.62 | 8.2 0.93 | 14.1 1.6 | 16.8 1.9 | 26 3.0 | 31 3.6 | 52 5.9 | 78 8.9 | 88 10 | 88 10 | 88 10 | 88 10 |
| | | 60 Hz | 4.9 0.56 | 6.0 0.68 | 8.8 1.0 | 15.0 1.7 | 17.7 2.0 | 28 3.2 | 34 3.9 | 57 6.5 | 85 9.7 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 1.50 0.17 | 1.85 0.21 | 2.7 0.31 | 4.5 0.51 | 5.4 0.62 | 8.6 0.98 | 10.6 1.2 | 17.7 2.0 | 25 2.9 | 34 3.9 | 48 5.5 | 81 9.2 | 88 10 | 88 10 |
| VSI425C-□E | 1200 r/min | 220 VAC 60 Hz | 7.6 0.86 | 8.8 1.0 | 13.2 1.5 | 23 2.6 | 27 3.1 | 43 4.9 | 52 5.9 | 86 9.8 | 130 14.7 | 141 16 | 141 16 | 141 16 | 141 16 |
| | | 230 VAC 50 Hz | 7.9 0.9 | 9.7 1.1 | 14.1 1.6 | 23 2.7 | 28 3.2 | 46 5.2 | 54 6.2 | 91 10.3 | 137 15.5 | 141 16 | 141 16 | 141 16 | 141 16 |
| | | 230 VAC 60 Hz | 7.1 0.81 | 8.5 0.97 | 13.2 1.5 | 21 2.4 | 25 2.9 | 40 4.6 | 49 5.6 | 82 9.3 | 123 13.9 | 141 16 | 141 16 | 141 16 | 141 16 |
| | 90 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 64 7.3 | 107 12.2 | 129 14.6 | 129 14.6 |
| VSI540C-□E | 1200 r/min | 220 VAC 60 Hz | 11.5 1.3 | 13.2 1.5 | 20 2.3 | 33 3.8 | 39 4.5 | 63 7.2 | 76 8.7 | 127 14.4 | 192 21.7 | 240 27.2 | 260 30 | 260 30 | — |
| | | 230 VAC 50 Hz | 12.3 1.4 | 15.0 1.7 | 23 2.6 | 38 4.3 | 46 5.2 | 73 8.3 | 87 9.9 | 146 16.5 | 210 24.8 | 260 30 | 260 30 | 260 30 | — |
| | | 230 VAC 60 Hz | 10.6 1.2 | 12.3 1.4 | 18.5 2.1 | 30 3.5 | 37 4.2 | 59 6.7 | 70 8.0 | 118 13.4 | 177 20.1 | 223 25.3 | 260 30 | 260 30 | — |
| | 90 r/min | 220 VAC 60 Hz | 3.0 0.34 | 3.6 0.41 | 5.3 0.61 | 8.8 1.0 | 10.6 1.2 | 16.8 1.9 | 20 2.3 | 34 3.9 | 51 5.8 | 64 7.3 | 96 10.9 | 161 18.2 | — |
| | | 230 VAC | 2.8 0.32 | 3.3 0.38 | 5.0 0.57 | 8.4 0.95 | 9.7 1.1 | 15.9 1.8 | 19.4 2.2 | 31 3.6 | 47 5.4 | 60 6.8 | 90 10.2 | 150 17 | — |
| VSI560C-□E | 1200 r/min | 230 VAC 50 Hz 220 VAC 60 Hz 230 VAC 60 Hz | 19.4 2.2 | 23 2.6 | 35 4.0 | 58 6.6 | 69 7.9 | 111 12.6 | 134 15.2 | 220 25.3 | 260 30 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 220 VAC 60 Hz | 8.5 0.97 | 10.6 1.2 | 15.0 1.7 | 25 2.9 | 30 3.5 | 48 5.5 | 59 6.7 | 98 11.1 | 146 16.6 | 184 20.9 | 260 30 | 260 30 | — |
| | | 230 VAC 50 Hz 230 VAC 60 Hz | 6.8 0.77 7.1 0.81 | 8.1 0.92 8.5 0.97 | 12.3 1.4 13.2 1.5 | 20 2.3 21 2.4 | 24 2.8 25 2.9 | 38 4.4 40 4.6 | 46 5.3 49 5.6 | 77 8.8 82 9.3 | 116 13.2 123 13.9 | 146 16.5 154 17.5 | 210 24.8 230 26.2 | 260 30 260 30 | — — — |
| VSI590C-□E | 1200 r/min | 230 VAC 50 Hz 220 VAC 60 Hz 230 VAC 60 Hz | 29 3.3 | 34 3.9 | 52 5.9 | 87 9.9 | 100 11.3 | 166 18.8 | 200 22.6 | 330 37.7 | 350 40 | 350 40 | 350 40 | — | — |
| | 90 r/min | 230 VAC 50 Hz | 9.7 1.1 | 11.5 1.3 | 17.7 2.0 | 29 3.3 | 33 3.8 | 55 6.3 | 67 7.6 | 111 12.6 | 158 17.9 | 210 23.8 | 310 35.7 | — | — |
| | | 230 VAC 60 Hz | 11.5 1.3 | 13.2 1.5 | 20 2.3 | 33 3.8 | 38 4.3 | 63 7.2 | 76 8.7 | 127 14.4 | 180 20.4 | 240 27.2 | 350 40 | — | — |

- 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; a white background indicates rotation in the opposite direction.

● V Series Reversible Motors – 30-Minute Rating

◆ Single-Phase 115 VAC Applicable Speed Controller: **ES01** Unit-Upper Values: lb-in/Lower Values: N-m

| Model Combination Type | Gear Ratio Speed | 5 | 6 | 9 | 15 | 18 | 30 | 36 | 60 | 90 | 120 | 180 | 300 | 360 |
|------------------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|
| VSR206A-□U | 1200 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| | 90 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| VSR315A-□U | 1200 r/min | 4.9 0.56 | 6.0 0.68 | 8.8 1.0 | 15.0 1.7 | 17.7 2.0 | 28 3.2 | 34 3.9 | 57 6.5 | 85 9.7 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 3.3 0.38 | 4.0 0.46 | 6.1 0.69 | 9.7 1.1 | 12.3 1.4 | 19.4 2.2 | 23 2.6 | 38 4.4 | 58 6.6 | 77 8.8 | 88 10 | 88 10 | 88 10 |
| VSR425A-□U | 1200 r/min | 8.1 0.92 | 9.7 1.1 | 15.0 1.7 | 24 2.8 | 29 3.3 | 46 5.3 | 55 6.3 | 93 10.6 | 140 15.9 | 141 16 | 141 16 | 141 16 | 141 16 |
| | 90 r/min | 4.4 0.5 | 5.2 0.59 | 7.8 0.89 | 13.2 1.5 | 15.9 1.8 | 24 2.8 | 30 3.4 | 50 5.7 | 75 8.5 | 100 11.4 | 141 16 | 141 16 | 141 16 |
| VSR540A-□U | 1200 r/min | 12.3 1.4 | 15.0 1.7 | 23 2.6 | 38 4.3 | 46 5.2 | 73 8.3 | 87 9.9 | 146 16.5 | 210 24.8 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 6.1 0.7 | 7.4 0.84 | 11.5 1.3 | 18.5 2.1 | 22 2.5 | 35 4.0 | 42 4.8 | 70 8.0 | 106 12.0 | 133 15.1 | 200 22.6 | 260 30 | — |
| VSR560A-□U | 1200 r/min | 19.4 2.2 | 23 2.6 | 35 4.0 | 58 6.6 | 69 7.9 | 111 12.6 | 134 15.2 | 220 25.3 | 260 30 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 10.6 1.2 | 13.2 1.5 | 19.4 2.2 | 31 3.6 | 38 4.4 | 61 7.0 | 74 8.4 | 123 13.9 | 184 20.9 | 230 26.2 | 260 30 | 260 30 | — |
| VSR590A-□U | 1200 r/min | 29 3.3 | 34 3.9 | 52 5.9 | 87 9.9 | 100 11.3 | 166 18.8 | 200 22.6 | 330 37.7 | 350 40 | 350 40 | 350 40 | — | — |
| | 90 r/min | 12.3 1.4 | 15.0 1.7 | 23 2.6 | 38 4.3 | 44 5.0 | 73 8.3 | 87 9.9 | 146 16.5 | 200 23.3 | 270 31.1 | 350 40 | — | — |

◆ Single-Phase 220/230 VAC Applicable Speed Controller: **ES02** Unit-Upper Values: lb-in/Lower Values: N-m

| Model Combination Type | Gear Ratio Speed | 5 | 6 | 9 | 15 | 18 | 30 | 36 | 60 | 90 | 120 | 180 | 300 | 360 |
|------------------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|
| VSR206C-□E | 1200 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| | 90 r/min | 2.0 0.23 | 2.3 0.27 | 3.6 0.41 | 6.0 0.68 | 7.1 0.81 | 11.5 1.3 | 13.2 1.5 | 23 2.6 | 34 3.9 | 46 5.2 | 53 6 | 53 6 | 53 6 |
| VSR315C-□E | 1200 r/min | 4.9 0.56 | 6.0 0.68 | 8.8 1.0 | 15.0 1.7 | 17.7 2.0 | 28 3.2 | 34 3.9 | 57 6.5 | 85 9.7 | 88 10 | 88 10 | 88 10 | 88 10 |
| | 90 r/min | 3.4 0.39 | 4.1 0.47 | 6.1 0.7 | 10.6 1.2 | 12.3 1.4 | 19.4 2.2 | 23 2.7 | 39 4.5 | 59 6.7 | 79 9.0 | 88 10 | 88 10 | 88 10 |
| VSR425C-□E | 1200 r/min | 8.1 0.92 | 9.7 1.1 | 15.0 1.7 | 24 2.8 | 29 3.3 | 46 5.3 | 55 6.3 | 93 10.6 | 140 15.9 | 141 16 | 141 16 | 141 16 | 141 16 |
| | 90 r/min | 4.6 0.52 | 5.4 0.62 | 8.2 0.93 | 14.1 1.6 | 16.8 1.9 | 26 3.0 | 31 3.6 | 52 5.9 | 78 8.9 | 105 11.9 | 141 16 | 141 16 | 141 16 |
| VSR540C-□E | 1200 r/min | 12.3 1.4 | 15.0 1.7 | 23 2.6 | 38 4.3 | 46 5.2 | 73 8.3 | 87 9.9 | 146 16.5 | 210 24.8 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 6.8 0.77 | 8.1 0.92 | 12.3 1.4 | 20 2.3 | 24 2.8 | 38 4.4 | 46 5.3 | 77 8.8 | 116 13.2 | 146 16.5 | 210 24.8 | 260 30 | — |
| VSR560C-□E | 1200 r/min | 19.4 2.2 | 23 2.6 | 35 4.0 | 58 6.6 | 69 7.9 | 111 12.6 | 134 15.2 | 220 25.3 | 260 30 | 260 30 | 260 30 | 260 30 | — |
| | 90 r/min | 11.5 1.3 | 13.2 1.5 | 20 2.3 | 33 3.8 | 39 4.5 | 63 7.2 | 76 8.7 | 127 14.4 | 192 21.7 | 240 27.2 | 260 30 | 260 30 | — |
| VSR590C-□E | 1200 r/min | 29 3.3 | 34 3.9 | 52 5.9 | 87 9.9 | 100 11.3 | 166 18.8 | 200 22.6 | 330 37.7 | 350 40 | 350 40 | 350 40 | — | — |
| | 90 r/min | 14.1 1.6 | 16.8 1.9 | 24 2.8 | 41 4.7 | 47 5.4 | 79 9.0 | 95 10.8 | 160 18.1 | 220 25.5 | 300 34.0 | 350 40 | — | — |

● 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; a white background indicates rotation in the opposite direction.

■ Gearmotor — Torque Table when a Right-Angle Gearhead is Attached

Right-Angle Gearhead is available for World **K** Series.

→Page A-196

■ Permissible Overhung Load and Permissible Thrust Load

Motor (Round shaft type)→Page A-11

Gearhead→Page A-11

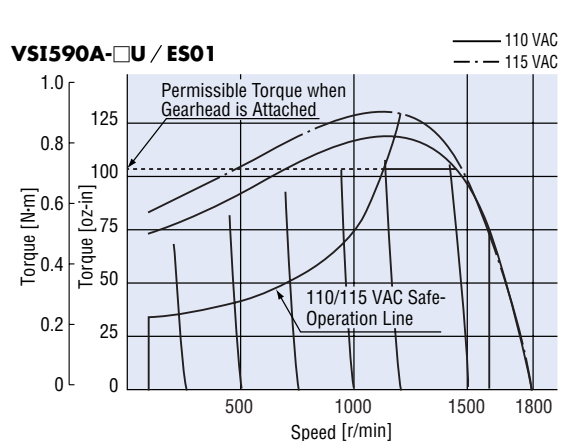
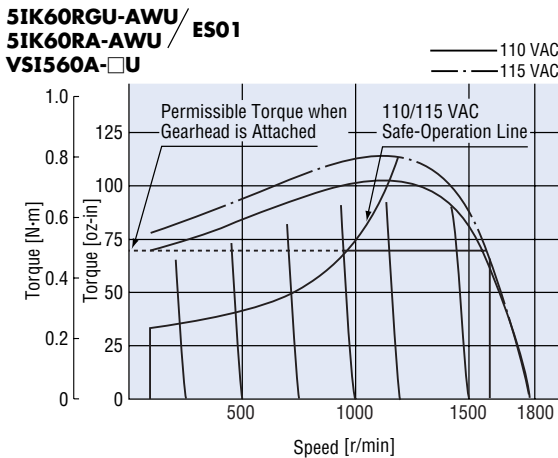
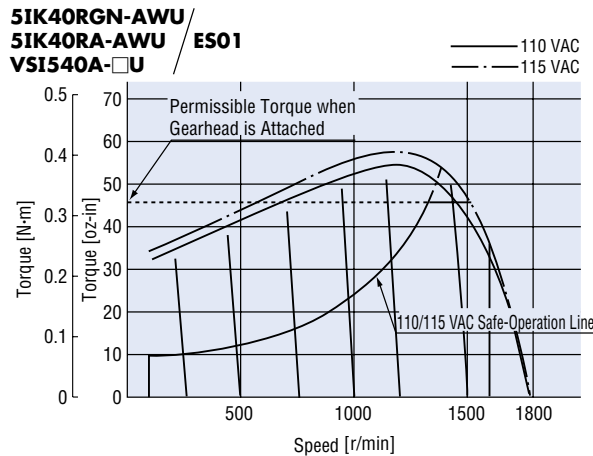
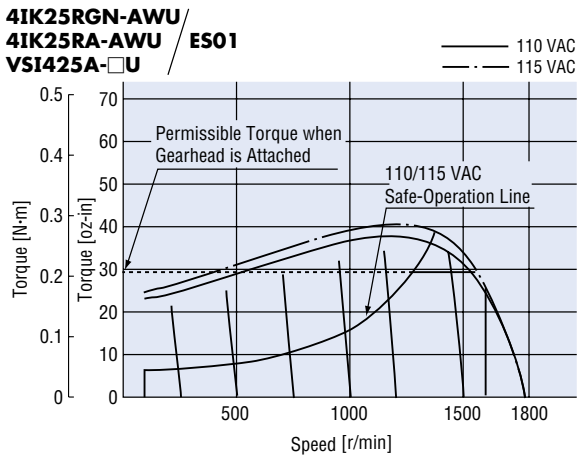
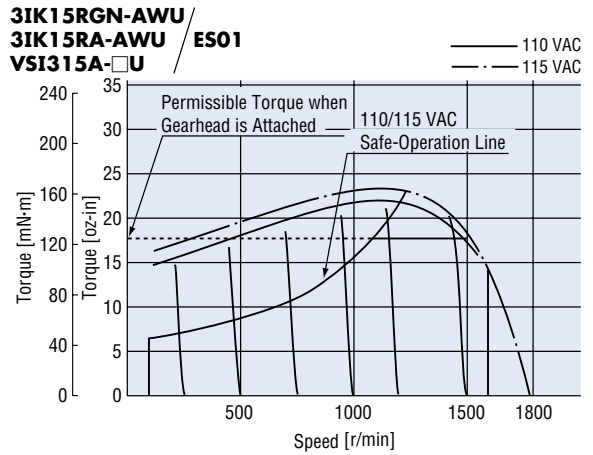
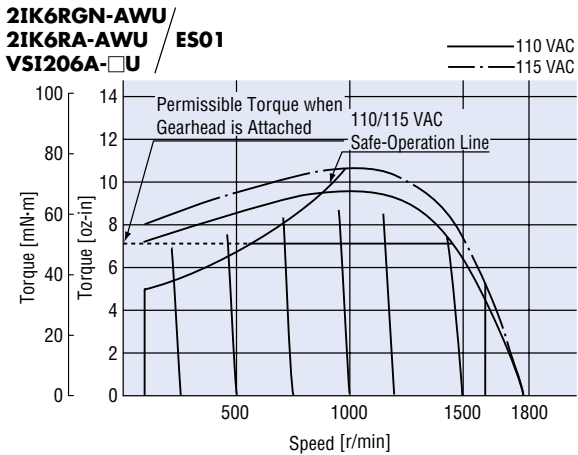
■ Permissible Load Inertia J for Gearhead

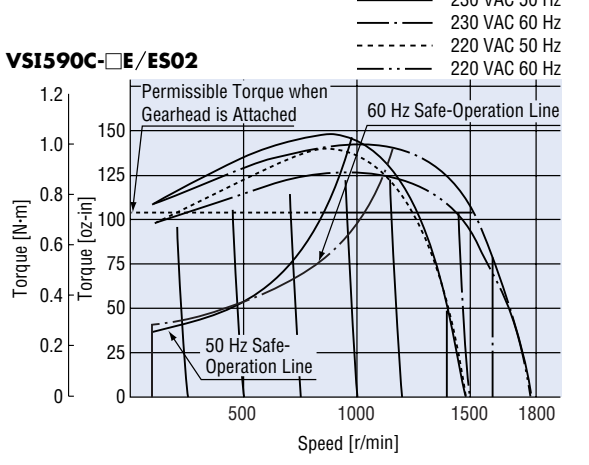
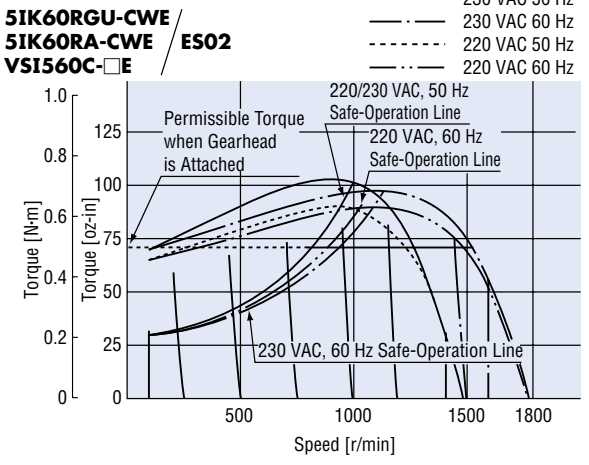
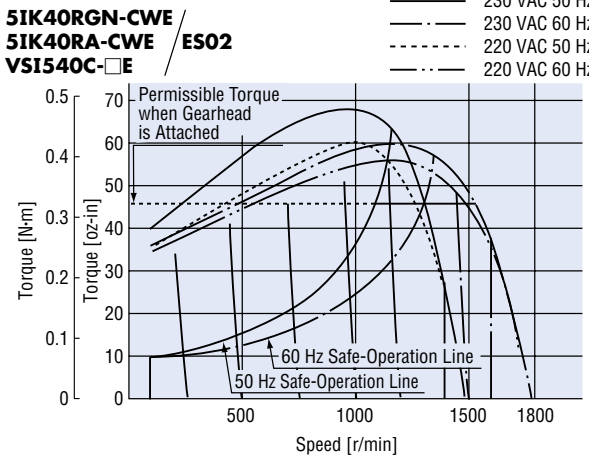
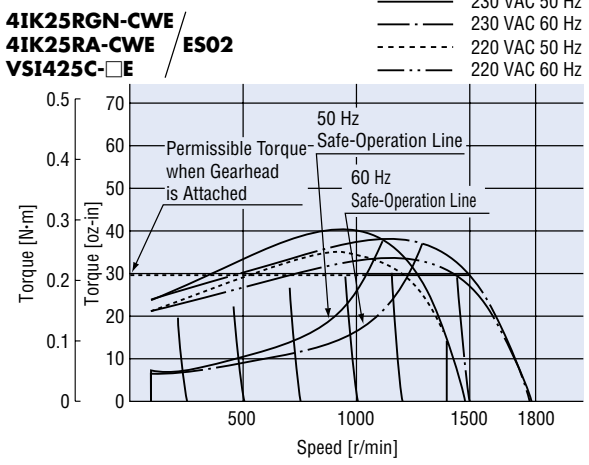
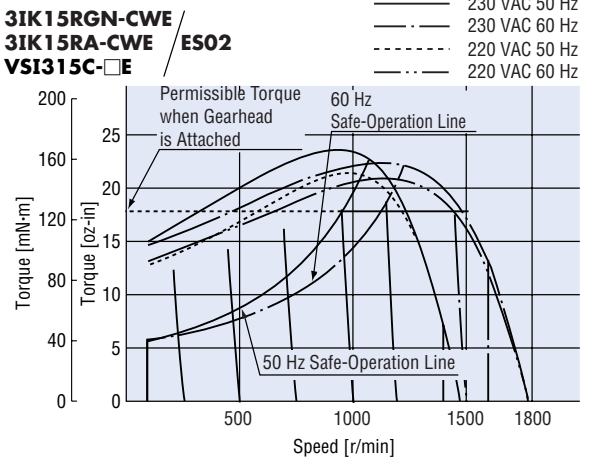
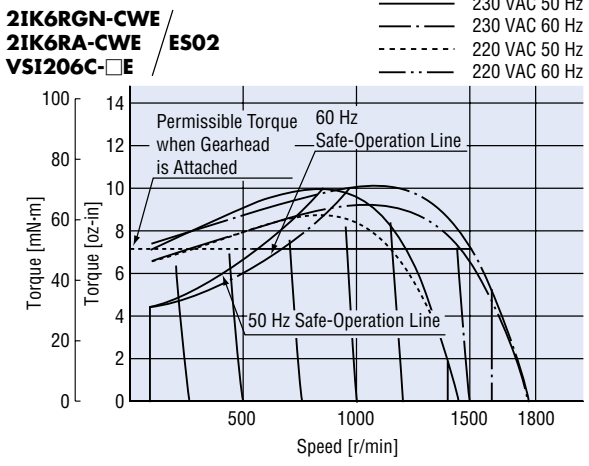
→Page A-12

■ Speed — Torque Characteristics

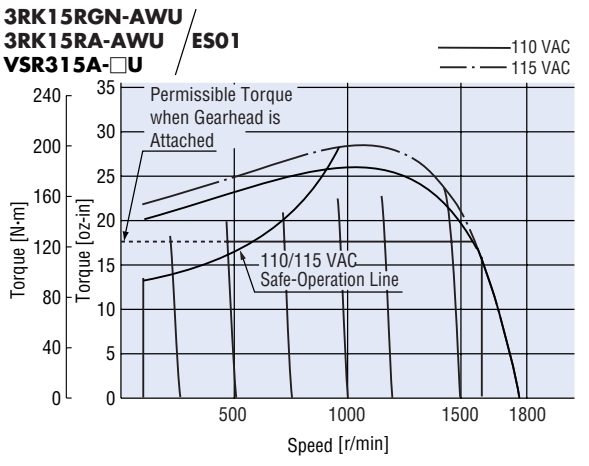
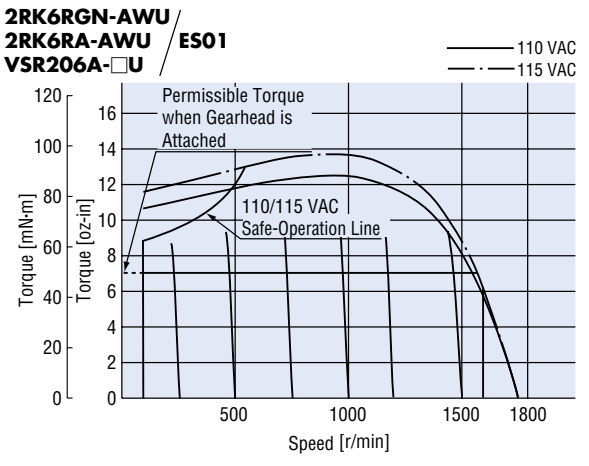
● Induction Motors

Enter the gear ratio in the box (□) within the **V** Series combination type model name. The characteristics of **V** Series are for motor's only.

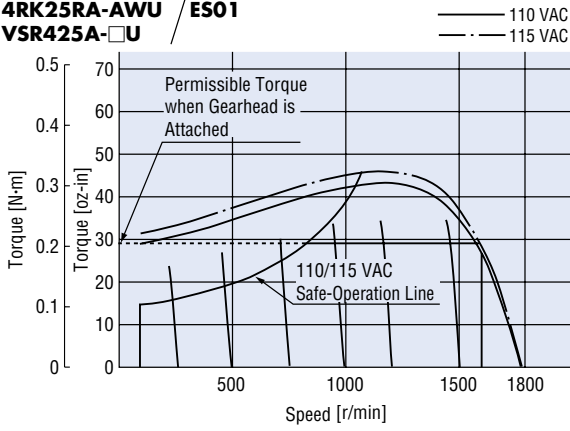




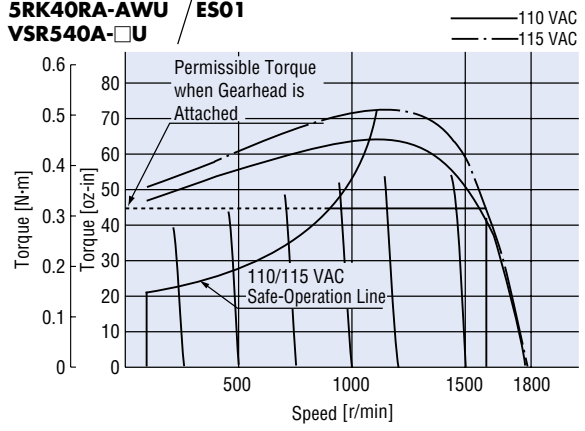
● Reversible Motors



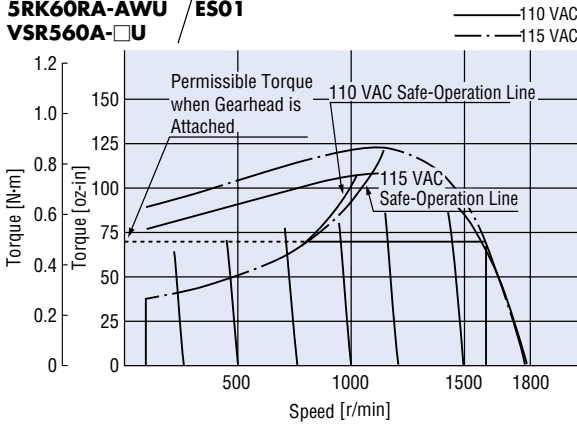
4RK25RGN-AWU / 4RK25RA-AWU / ES01
VSR425A-U



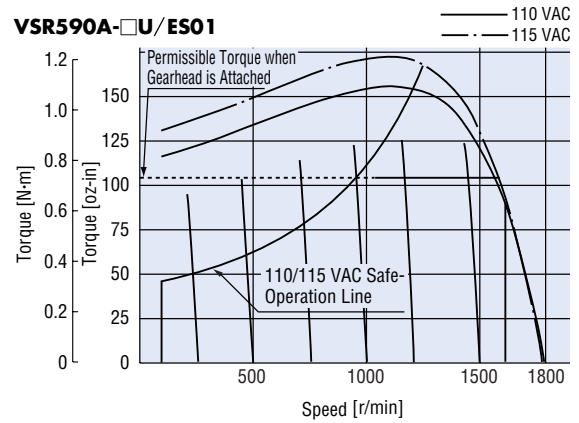
5RK40RGN-AWU / 5RK40RA-AWU / ES01
VSR540A-U



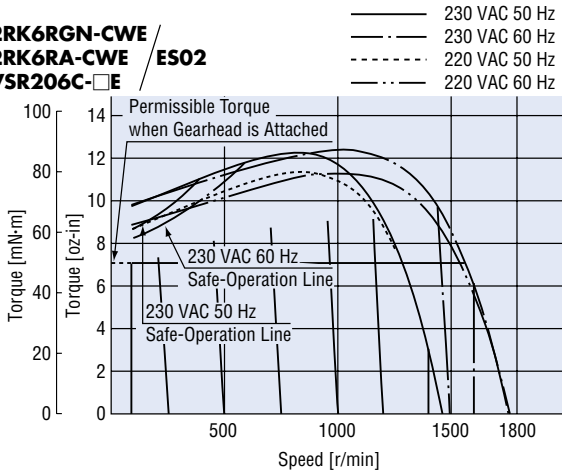
5RK60RGN-AWU / 5RK60RA-AWU / ES01
VSR560A-U



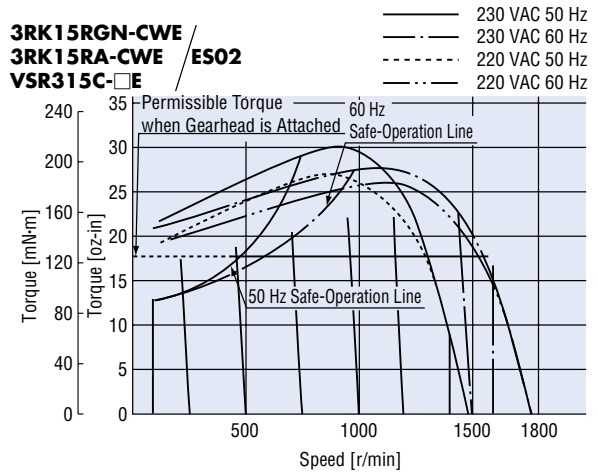
VSR590A-U / ES01



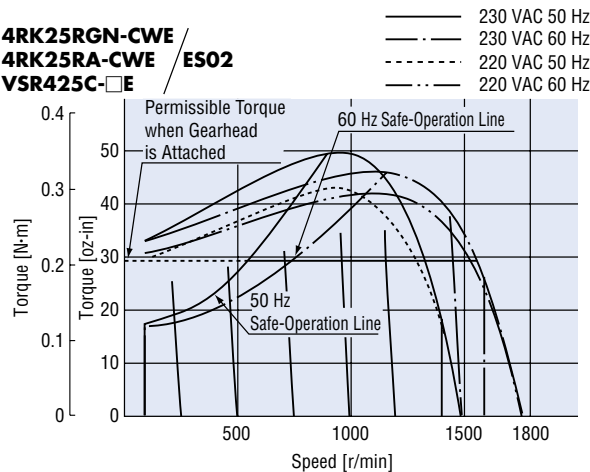
2RK6RGN-CWE / 2RK6RA-CWE / ES02
VSR206C-E



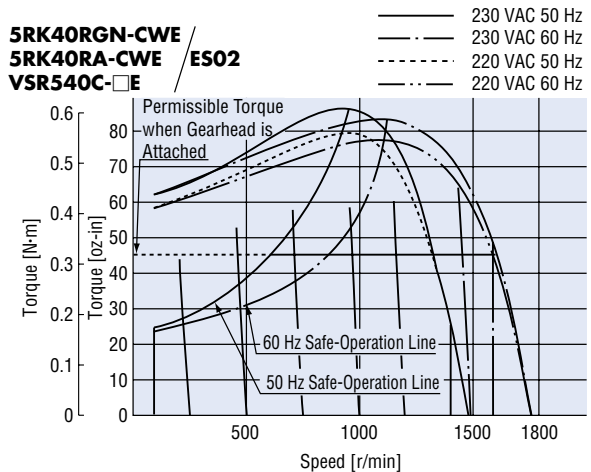
3RK15RGN-CWE / 3RK15RA-CWE / ES02
VSR315C-E



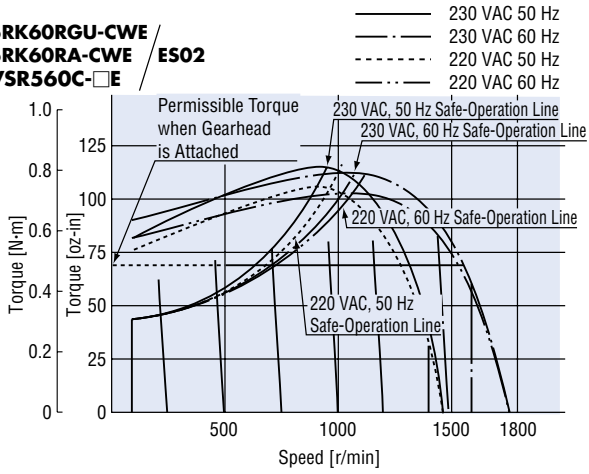
4RK25RGN-CWE / 4RK25RA-CWE / ES02
VSR425C-E



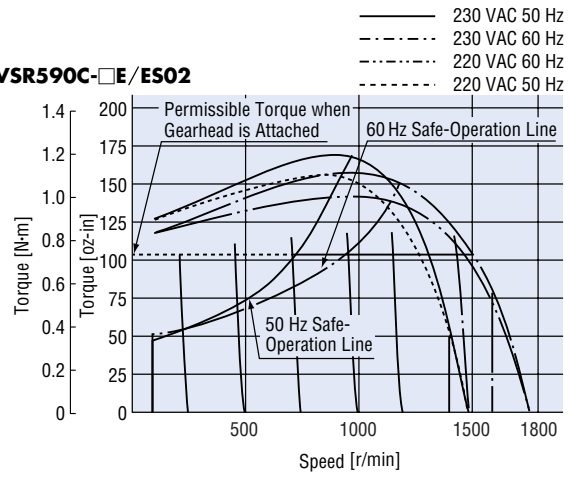
5RK40RGN-CWE / 5RK40RA-CWE / ES02
VSR540C-E



**5RK60RGU-CWE /
5RK60RA-CWE / ES02
VSR560C-□E**



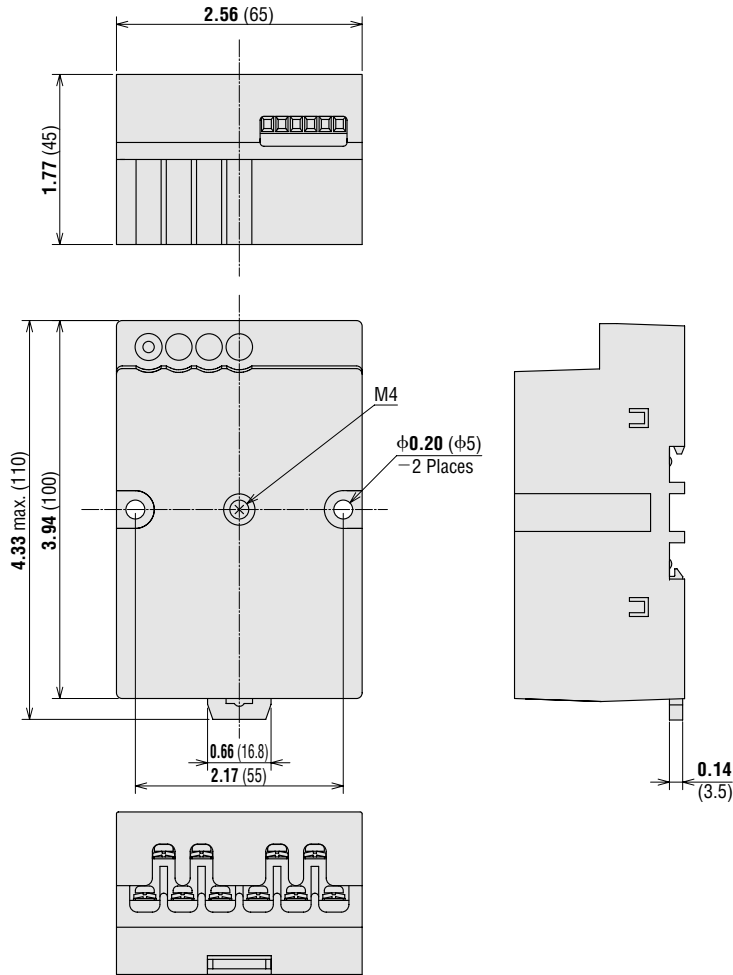
VSR590C-□E / ES02



Dimensions Scale 1/4, Unit = inch (mm)

Speed Controller: **ES01, ES02** (Scale 1/2)
Weight: 0.4 lb. (0.18 kg)

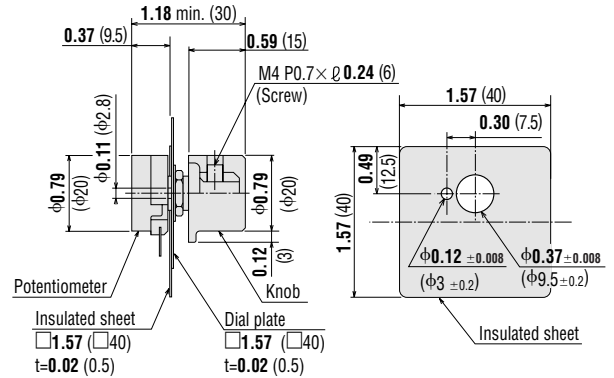
DXF A394



External Speed Potentiometer (Included)

(Scale 1/2)

PAVR-20KZ



● World K Series

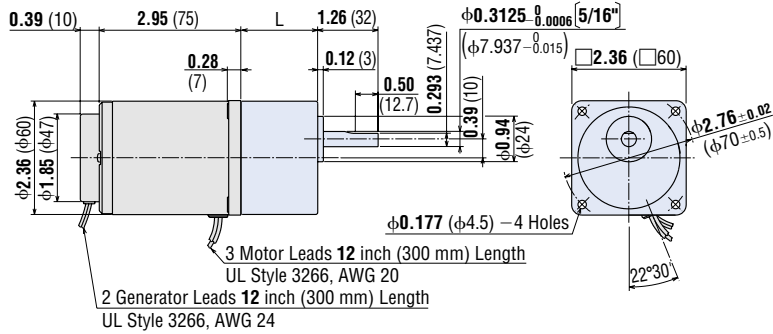
◆ Motor/Gearhead (Pinion Shaft Type)

2IK6RGN-AWU
2IK6RGN-CWE
2RK6RGN-AWU
2RK6RGN-CWE

2GN□KA

Weight: 1.76 lb. (0.8 kg) / Weight: 0.88 lb. (0.4 kg)

DXF A065AU (**2GN3KA~18KA**)
 A065BU (**2GN25KA~180KA**)



2GN3KA-18KA: L = 1.18 (30)
2GN25KA-180KA: L = 1.57 (40)

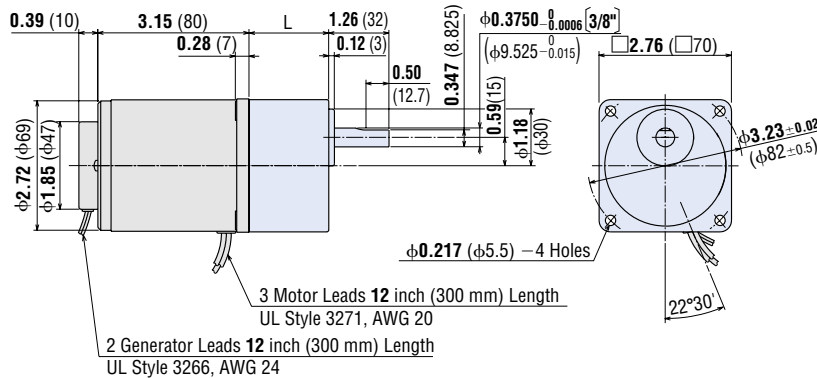
◆ Motor/Gearhead (Pinion Shaft Type)

3IK15RGN-AWU
3IK15RGN-CWE
3RK15RGN-AWU
3RK15RGN-CWE

3GN□KA

Weight: 2.6 lb. (1.2 kg) / Weight: 1.21 lb. (0.55 kg)

DXF A066AU (**3GN3KA~18KA**)
 A066BU (**3GN25KA~180KA**)



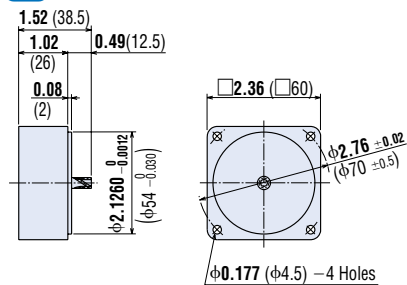
3GN3KA-18KA: L = 1.26 (32)
3GN25KA-180KA: L = 1.65 (42)

● Decimal Gearhead

Can be connected to **2IK6RGN**, **2RK6RGN** type

2GN10XK Weight: 0.44 lb. (0.2 kg)

DXF A003

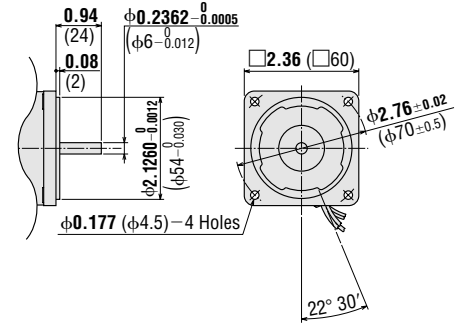


◆ Round Shaft Type

2IK6RA-AWU
2IK6RA-CWE
2RK6RA-AWU
2RK6RA-CWE

Weight: 1.76 lb. (0.8 kg)

DXF A364

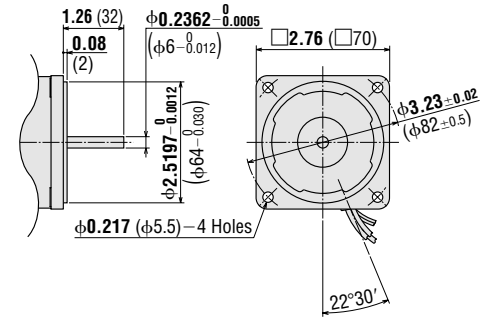


◆ Round Shaft Type

3IK15RA-AWU
3IK15RA-CWE
3RK15RA-AWU
3RK15RA-CWE

Weight: 2.6 lb. (1.2 kg)

DXF A365

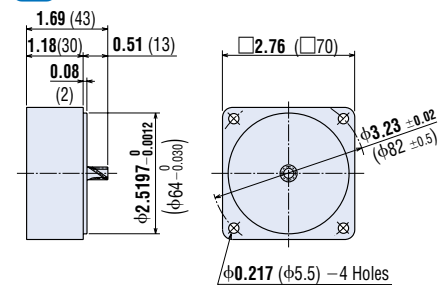


● Decimal Gearhead

Can be connected to **3IK15RGN**, **3RK15RGN** type

3GN10XK Weight: 0.66 lb. (0.3 kg)

DXF A009

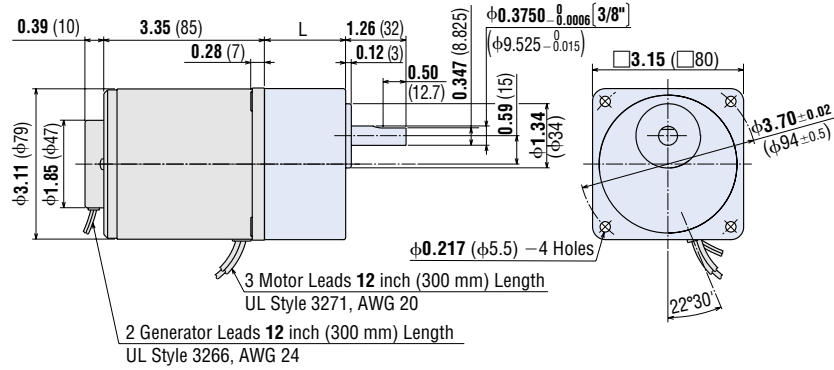


◆ Motor/Gearhead (Pinion Shaft Type)

41K25RGN-AWU
41K25RGN-CWE
4RK25RGN-AWU
4RK25RGN-CWE
4GN□KA

Weight: 3.5 lb. (1.6 kg) Weight: 1.43 lb. (0.65 kg)

DXF A067AU (**4GN3KA~18KA**)
 A067BU (**4GN25KA~180KA**)



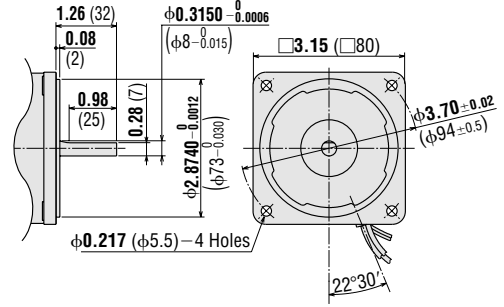
4GN3KA~18KA: L = 1.26 (32)
4GN25KA~180KA: L = 1.67 (42.5)

◆ Round Shaft Type

41K25RA-AWU
41K25RA-CWE
4RK25RA-AWU
4RK25RA-CWE
A366

Weight: 3.5 lb. (1.6 kg)

DXF A366

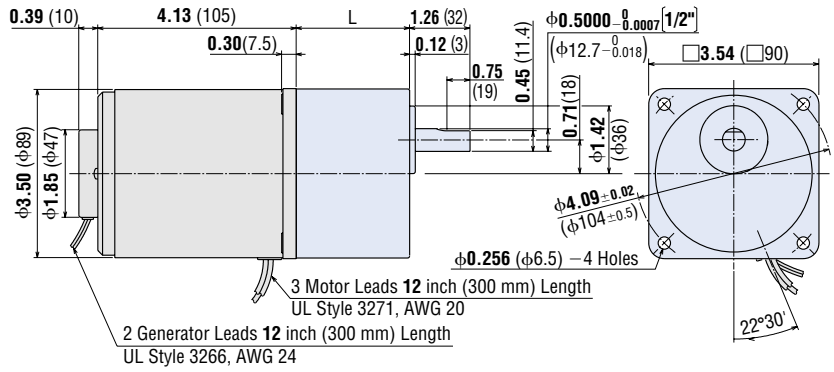


◆ Motor/Gearhead (Pinion Shaft Type)

51K40RGN-AWU
51K40RGN-CWE
5RK40RGN-AWU
5RK40RGN-CWE
5GN□KA

Weight: 5.7 lb. (2.6 kg) Weight: 3.3 lb. (1.5 kg)

DXF A068AU (**5GN3KA~18KA**)
 A068BU (**5GN25KA~180KA**)



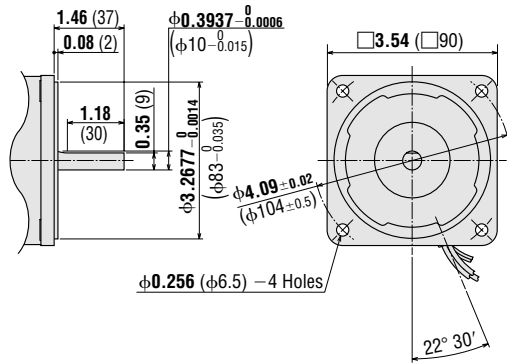
5GN3KA~18KA: L = 1.65 (42)
5GN25KA~180KA: L = 2.36 (60)

◆ Round Shaft Type

51K40RA-AWU
51K40RA-CWE
5RK40RA-AWU
5RK40RA-CWE
A367

Weight: 5.7 lb. (2.6 kg)

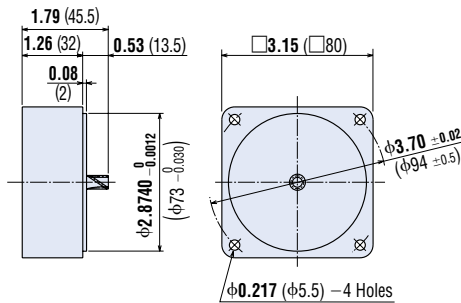
DXF A367



● Decimal Gearhead

Can be connected to **41K25RGN**, **4RK25RGN** type
4GN10XK Weight: 0.88 lb. (0.4 kg)

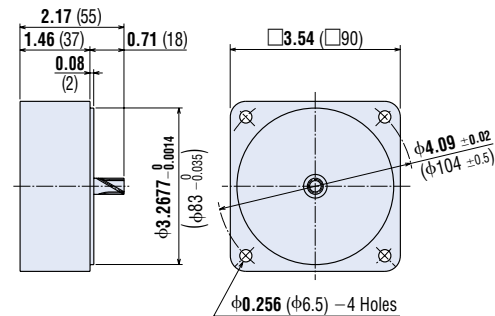
DXF A013



● Decimal Gearhead

Can be connected to **51K40RGN**, **5RK40RGN** type
5GN10XK Weight: 1.3 lb. (0.6 kg)

DXF A022



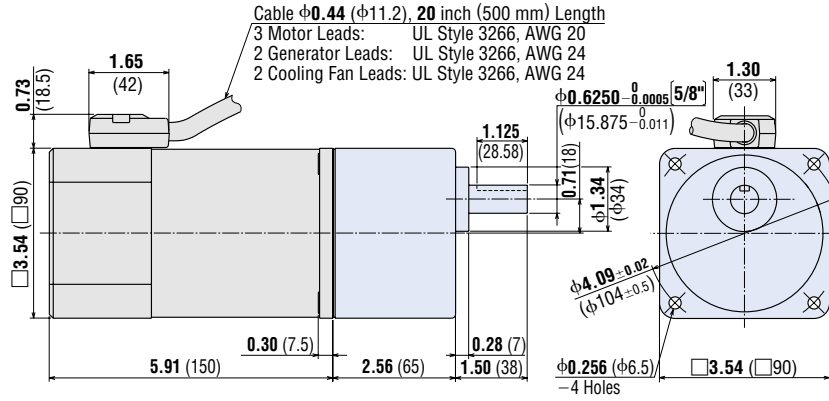
◆ Motor/Gearhead (Pinion Shaft Type)

5IK60RGU-AWU
5IK60RGU-CWE
5RK60RGU-AWU
5RK60RGU-CWE

5GU□KA

Weight: 7.1 lb. (3.2 kg) Weight: 3.3 lb. (1.5 kg)

DXF A069U (5GU3KA~180KA)

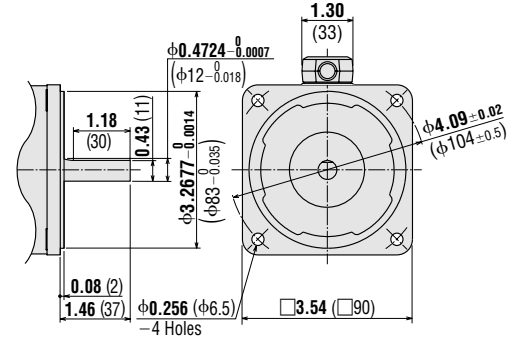


◆ Round Shaft Type

5IK60RA-AWU
5IK60RA-CWE
5RK60RA-AWU
5RK60RA-CWE

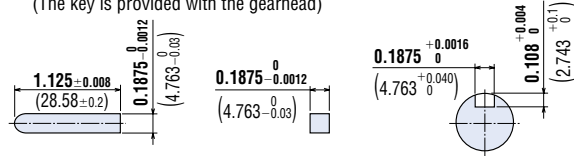
Weight: 7.1 lb. (3.2 kg)

DXF A358



● Key and Key Slot (Scale 1/2)

(The key is provided with the gearhead)

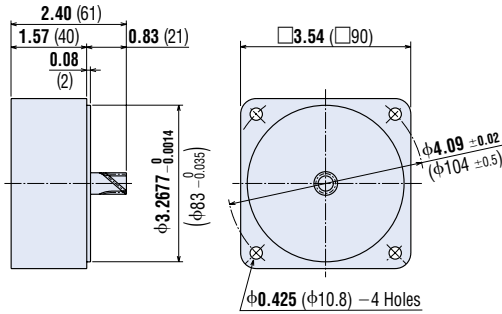


● Decimal Gearhead

Can be connected to 5IK60RGU, 5RK60RGU type

5GU10XKB Weight: 1.3 lb. (0.6 kg)

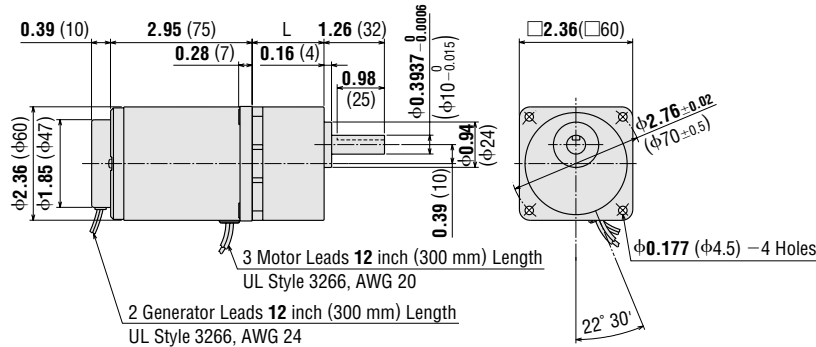
DXF A029



● **V Series**
 ◆ **Combination Type**

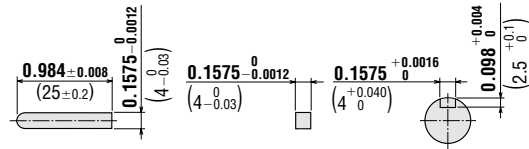
VS1206A[C]-□U[E]
VSR206A[C]-□U[E]
 Weight: 2.9 lb. (1.3 kg) (Including Gearhead)

DXF A216A (Gear Ratio: **5~18**)
 A216B (Gear Ratio: **30~120**)
 A216C (Gear Ratio: **180~360**)



Gear Ratio: 5~18: L = **1.34** (34)
 Gear Ratio: 30~120: L = **1.5** (38)
 Gear Ratio: 180~360: L = **1.69** (43)

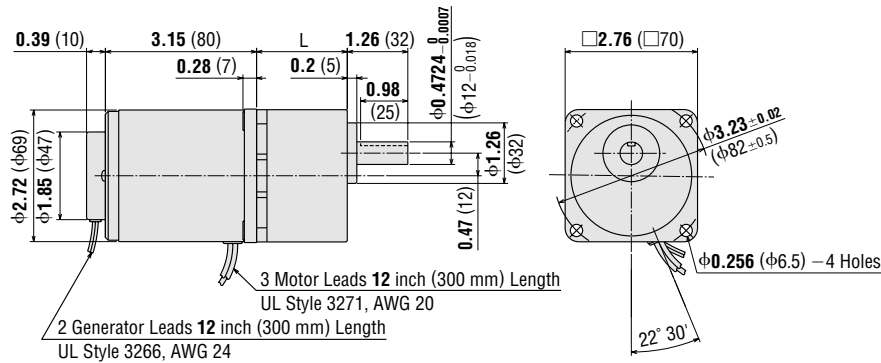
● **Key and Key Slot (Scale 1/2)**
 (The key is provided with the gearhead)



◆ **Combination Type**

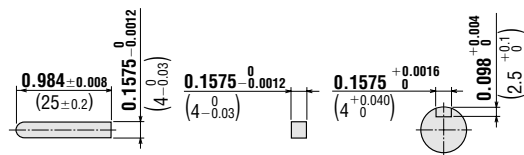
VS1315A[C]-□U[E]
VSR315A[C]-□U[E]
 Weight: 4.0 lb. (1.8 kg) (Including Gearhead)

DXF A243A (Gear Ratio: **5~18**)
 A243B (Gear Ratio: **30~120**)
 A243C (Gear Ratio: **180~360**)



Gear Ratio: 5~18: L = **1.5** (38)
 Gear Ratio: 30~120: L = **1.69** (43)
 Gear Ratio: 180~360: L = **1.89** (48)

● **Key and Key Slot (Scale 1/2)**
 (The key is provided with the gearhead)



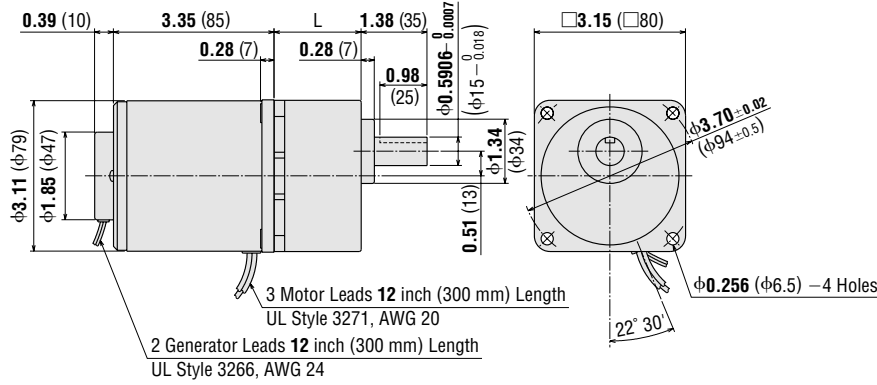
◆ **Combination Type**

VS1425A[C]-□U[E]

VSR425A[C]-□U[E]

Weight: 5.7 lb. (2.6 kg) (Including Gearhead)

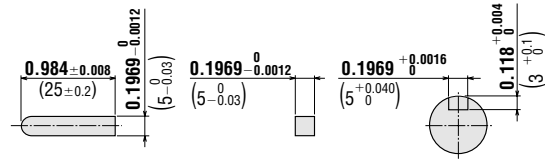
- DXF** A217A (Gear Ratio: **5~18**)
- A217B (Gear Ratio: **30~120**)
- A217C (Gear Ratio: **180~360**)



- Gear Ratio: 5~18: L = **1.61** (41)
- Gear Ratio: 30~120: L = **1.81** (46)
- Gear Ratio: 180~360: L = **2.01** (51)

● **Key and Key Slot (Scale 1/2)**

(The key is provided with the gearhead)



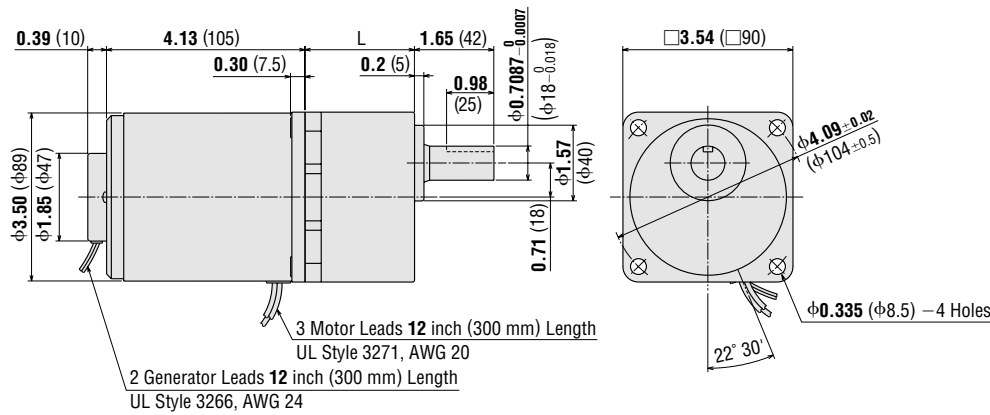
◆ **Combination Type**

VS1540A[C]-□U[E]

VSR540A[C]-□U[E]

Weight: 9.0 lb. (4.1 kg) (Including Gearhead)

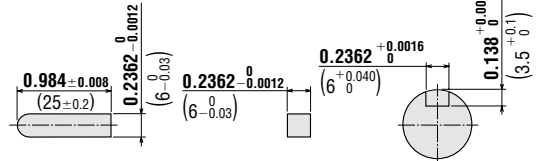
- DXF** A218A (Gear Ratio: **5~18**)
- A218B (Gear Ratio: **30~90**)
- A218C (Gear Ratio: **120~300**)



- Gear Ratio: 5~18: L = **1.77** (45)
- Gear Ratio: 30~90: L = **2.28** (58)
- Gear Ratio: 120~300: L = **2.52** (64)

● **Key and Key Slot (Scale 1/2)**

(The key is provided with the gearhead)



◆ Combination Type

VS1560A[C]-□U[E]

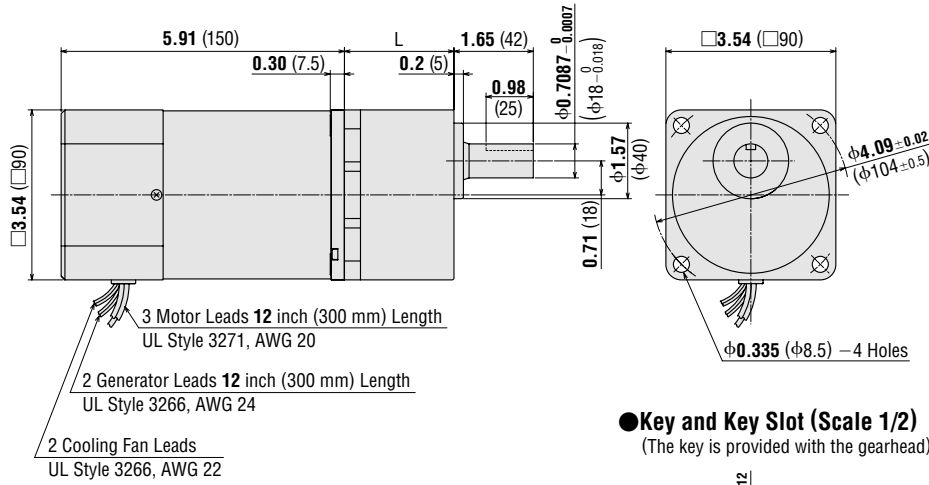
VSR560A[C]-□U[E]

Weight: 9.5 lb. (4.3 kg) (Including Gearhead)

DXF A395A (Gear Ratio: **5~18**)

A395B (Gear Ratio: **30~90**)

A395C (Gear Ratio: **120~300**)



Gear Ratio: 5~18: L = 1.77 (45)

Gear Ratio: 30~90: L = 2.28 (58)

Gear Ratio: 120~300: L = 2.52 (64)

◆ Combination Type

VS1590A[C]-□U[E]

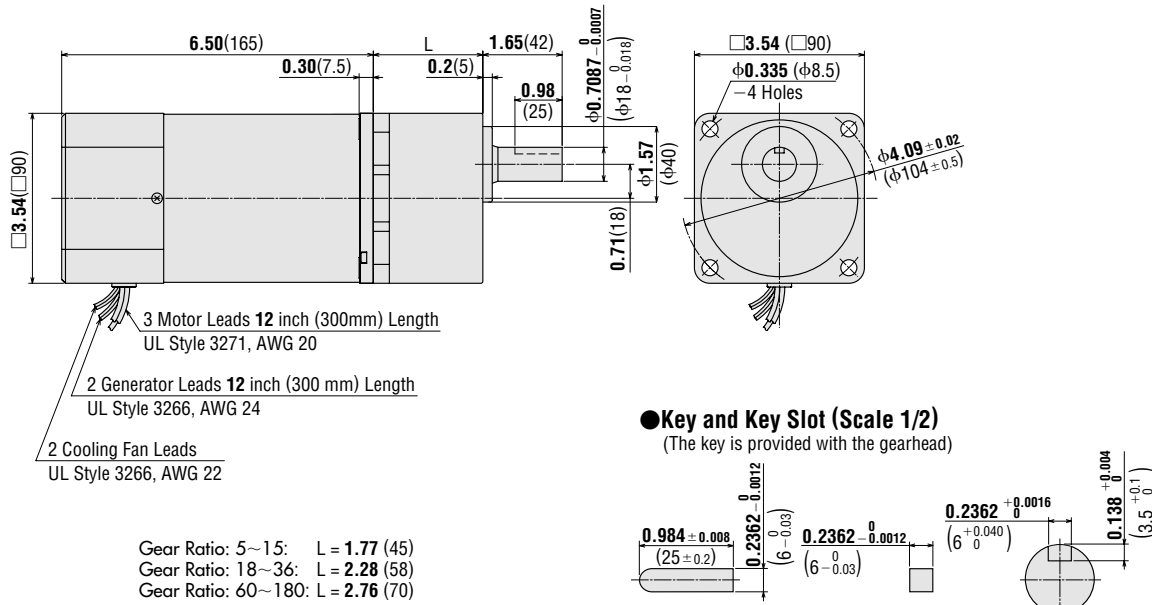
VSR590A[C]-□U[E]

Weight: 10.6 lb. (4.8 kg) (Including Gearhead)

DXF A396A (Gear Ratio: **5~15**)

A396B (Gear Ratio: **18~36**)

A396C (Gear Ratio: **60~180**)



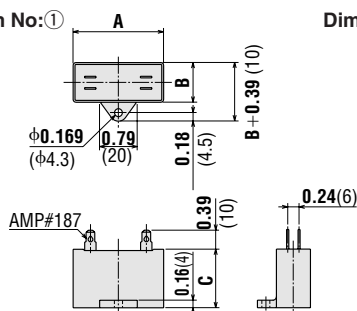
Gear Ratio: 5~15: L = 1.77 (45)

Gear Ratio: 18~36: L = 2.28 (58)

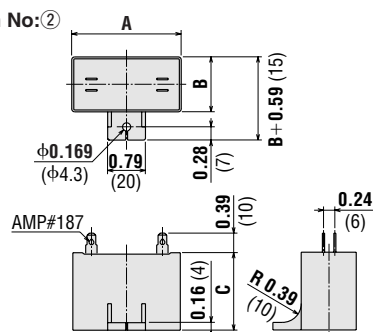
Gear Ratio: 60~180: L = 2.76 (70)

Capacitor Dimensions Unit = inch (mm)

Capacitor (Included) Dimension No: ①



Dimension No: ②



World K Series

| Model | | Capacitor Model | A | B | C | Weight oz. (g) | Dimension No. |
|---------------------|--------------------|-----------------|-----------|-------------|-------------|----------------|---------------|
| Pinion Shaft Type | Round Shaft Type | | | | | | |
| 2IK6RGN-AWU | 2IK6RA-AWU | CH25FAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | ① |
| 2IK6RGN-CWE | 2IK6RA-CWE | CH06BFAUL | 1.22 (31) | 0.57 (14.5) | 0.93 (23.5) | 0.53 (15) | |
| 3IK15RGN-AWU | 3IK15RA-AWU | CH45FAUL | 1.46 (37) | 0.71 (18) | 1.06 (27) | 1.06 (30) | |
| 3IK15RGN-CWE | 3IK15RA-CWE | CH10BFAUL | 1.46 (37) | 0.71 (18) | 1.06 (27) | 1.06 (30) | |
| 4IK25RGN-AWU | 4IK25RA-AWU | CH65CFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| 4IK25RGN-CWE | 4IK25RA-CWE | CH15BFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| 5IK40RGN-AWU | 5IK40RA-AWU | CH90CFAUL | 1.89 (48) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| 5IK40RGN-CWE | 5IK40RA-CWE | CH23BFAUL | 1.89 (48) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| 5IK60RGU-AWU | 5IK60RA-AWU | CH180CFAUL | 2.28 (58) | 0.93 (23.5) | 1.46 (37) | 2.5 (70) | |
| 5IK60RGU-CWE | 5IK60RA-CWE | CH40BFAUL | 2.28 (58) | 0.93 (23.5) | 1.46 (37) | 2.5 (70) | |
| 2RK6RGN-AWU | 2RK6RA-AWU | CH35FAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | ① |
| 2RK6RGN-CWE | 2RK6RA-CWE | CH08BFAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | |
| 3RK15RGN-AWU | 3RK15RA-AWU | CH60CFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| 3RK15RGN-CWE | 3RK15RA-CWE | CH15BFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| 4RK25RGN-AWU | 4RK25RA-AWU | CH80CFAUL | 1.89 (48) | 0.75 (19) | 1.14 (29) | 1.41 (40) | |
| 4RK25RGN-CWE | 4RK25RA-CWE | CH20BFAUL | 1.89 (48) | 0.75 (19) | 1.14 (29) | 1.24 (35) | |
| 5RK40RGN-AWU | 5RK40RA-AWU | CH120CFAUL | 2.28 (58) | 0.83 (21) | 1.22 (31) | 1.77 (50) | |
| 5RK40RGN-CWE | 5RK40RA-CWE | CH35BFAUL | 2.28 (58) | 0.87 (22) | 1.38 (35) | 1.94 (55) | |
| 5RK60RGU-AWU | 5RK60RA-AWU | CH200CFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.4 (95) | |
| 5RK60RGU-CWE | 5RK60RA-CWE | CH50BFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.0 (85) | |

• If you need to order a capacitor without a motor, add "-C" to the capacitor model name shown. A capacitor cap is included with a capacitor.

V Series

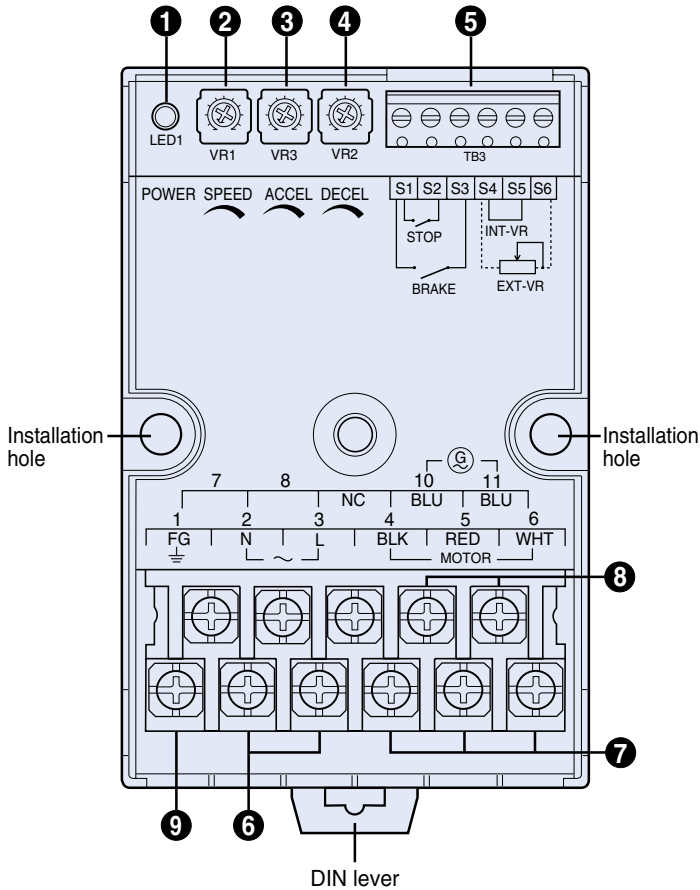
| Model Combination Type | Capacitor Model | A | B | C | Weight oz. (g) | Dimension No. |
|------------------------|-----------------|-----------|-------------|-------------|----------------|---------------|
| VSI206A-□U | CH25FAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | ① |
| VSI206C-□E | CH06BFAUL | 1.22 (31) | 0.57 (14.5) | 0.93 (23.5) | 0.53 (15) | |
| VSI315A-□U | CH45FAUL | 1.46 (37) | 0.71 (18) | 1.06 (27) | 1.06 (30) | |
| VSI315C-□E | CH10BFAUL | 1.46 (37) | 0.71 (18) | 1.06 (27) | 1.06 (30) | |
| VSI425A-□U | CH65CFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| VSI425C-□E | CH15BFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| VSI540A-□U | CH90CFAUL | 1.89 (48) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| VSI540C-□E | CH23BFAUL | 1.89 (48) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| VSI560A-□U | CH180CFAUL | 2.28 (58) | 0.93 (23.5) | 1.46 (37) | 2.5 (70) | |
| VSI560C-□E | CH40BFAUL | 2.28 (58) | 0.93 (23.5) | 1.46 (37) | 2.5 (70) | |
| VSI590A-□U | CH200CFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.4 (95) | |
| VSI590C-□E | CH60BFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.0 (85) | |
| VSR206A-□U | CH35FAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | ① |
| VSR206C-□E | CH08BFAUL | 1.22 (31) | 0.67 (17) | 1.06 (27) | 0.71 (20) | |
| VSR315A-□U | CH60CFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.41 (40) | |
| VSR315C-□E | CH15BFAUL | 1.5 (38) | 0.83 (21) | 1.22 (31) | 1.24 (35) | |
| VSR425A-□U | CH80CFAUL | 1.89 (48) | 0.75 (19) | 1.14 (29) | 1.41 (40) | |
| VSR425C-□E | CH20BFAUL | 1.89 (48) | 0.75 (19) | 1.14 (29) | 1.24 (35) | |
| VSR540A-□U | CH120CFAUL | 2.28 (58) | 0.83 (21) | 1.22 (31) | 1.77 (50) | |
| VSR540C-□E | CH35BFAUL | 2.28 (58) | 0.87 (22) | 1.38 (35) | 1.94 (55) | |
| VSR560A-□U | CH200CFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.4 (95) | |
| VSR560C-□E | CH50BFAUL | 2.28 (58) | 1.14 (29) | 1.61 (41) | 3.0 (85) | |
| VSR590A-□U | CH300CFAUL | 2.28 (58) | 1.38 (35) | 1.97 (50) | 4.9 (140) | ② |
| VSR590C-□E | CH70BFAUL | 2.28 (58) | 1.38 (35) | 1.97 (50) | 4.6 (130) | |

• If you need to order a capacitor without a motor, add "-C" to the capacitor model name shown. A capacitor cap is included with a capacitor.

■ Connection and Operation

● Names and Function of Parts

The illustration has the cover removed. Install the cover after connection.

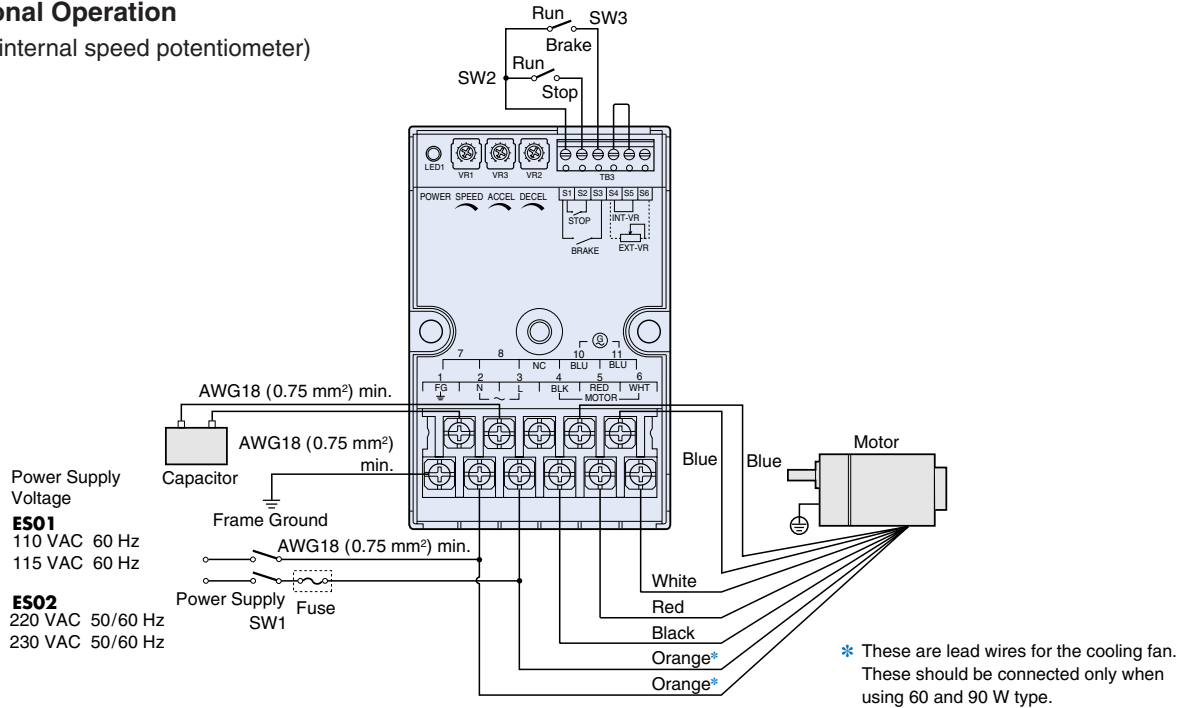


- 1 POWER LED**
Turns on (green) while power is being supplied.
- 2 Internal speed potentiometer**
Set the motor's operating speed.
- 3 Acceleration time potentiometer**
Set the acceleration time for motor startup.
- 4 Deceleration time potentiometer**
Set the deceleration time for motor stop.
- 5 Control 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)**
Connect the blue generator lead wires.
- 9 FG terminal (terminal 1)**

● **Connection Diagrams**

◆ **Uni-directional Operation**

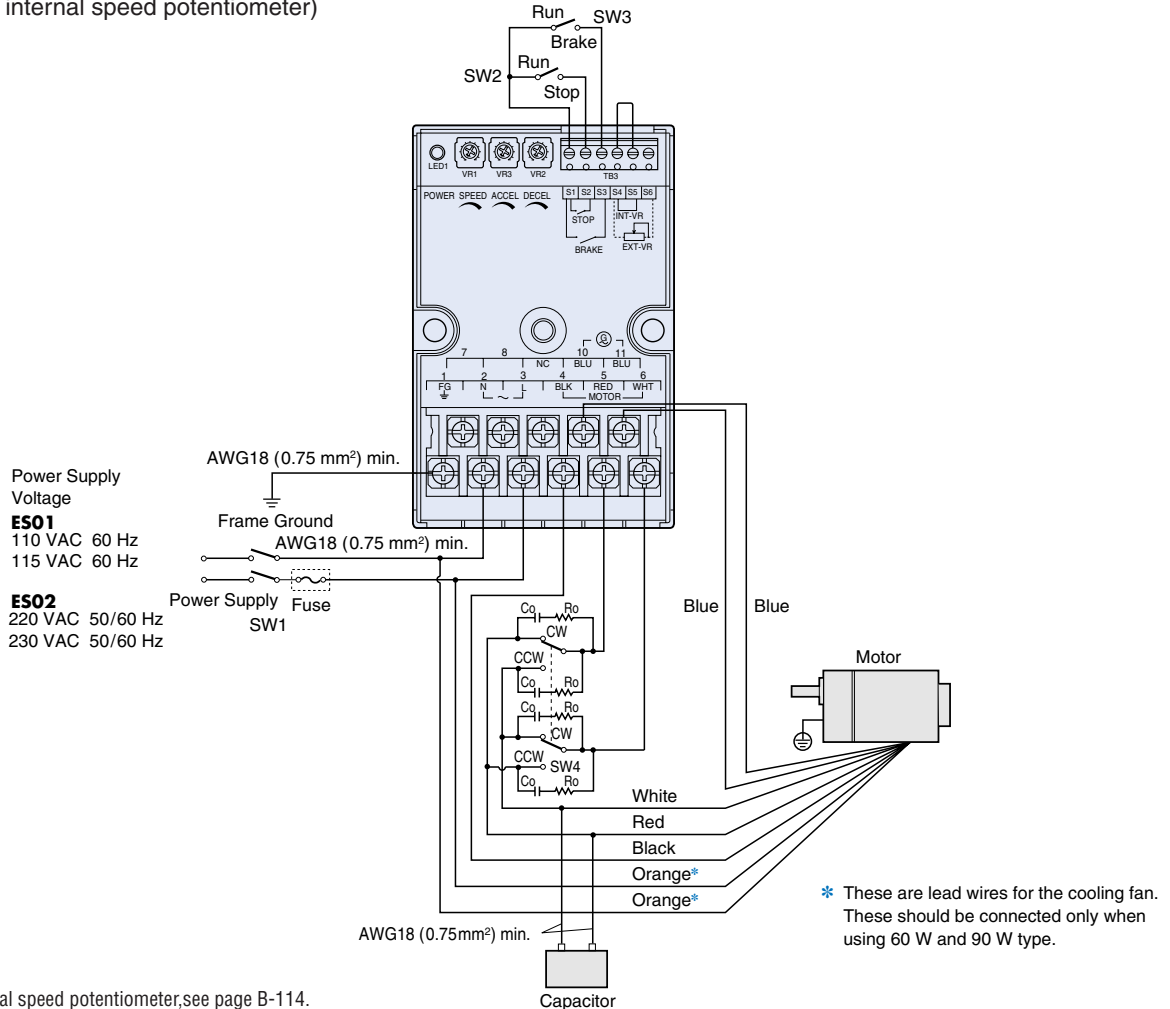
(When using internal speed potentiometer)



- For uni-directional operation, connect the lead wires of the motor to the controller in this order: For CW operation, connect the Red wire to terminal #5 and the White wire to terminal #6. For CCW operation, connect the White wire to terminal #5 and the Red wire to terminal #6.
- When using external speed potentiometer, see page B-114.

◆ **Bi-directional Operation**

(When using internal speed potentiometer)



- When using external speed potentiometer, see page B-114.

● Specifications of the Switches and Fuse

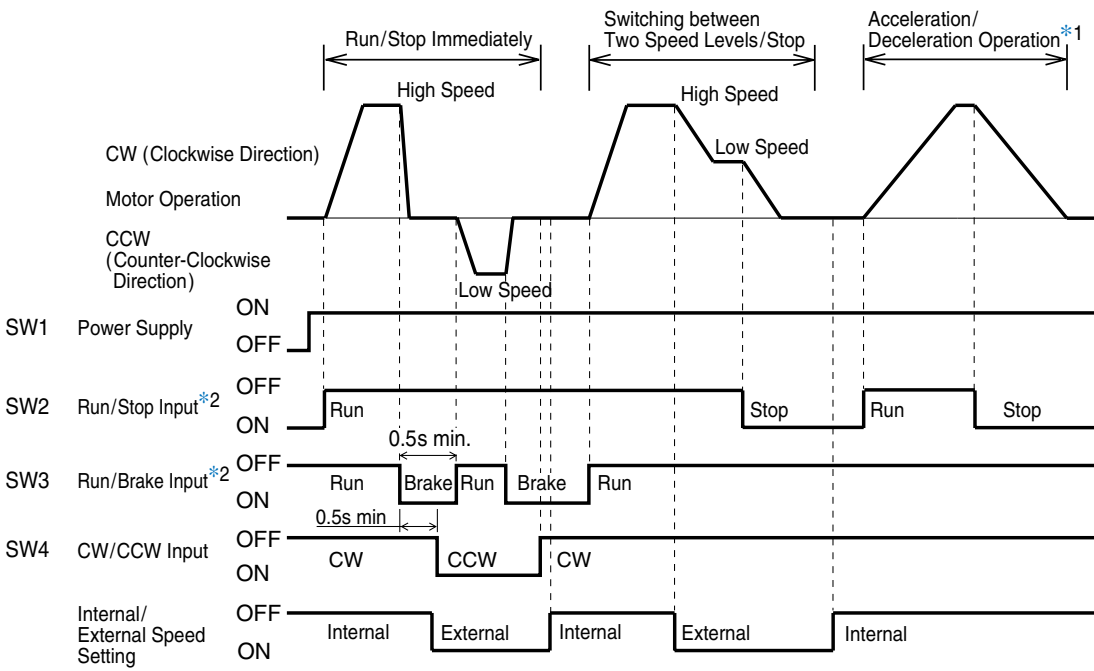
| | | |
|---------------------------|--|---|
| Power Supply Voltage | 110/115 VAC (ES01) | 220/230 VAC (ES02) |
| SW1 | 125 VAC 10 A | 250 VAC 5 A |
| SW2, SW3 | 18 VDC 1 mA | |
| SW4 | 125 VAC 10 A | 250 VAC 5 A |
| R0, C0 (Surge suppressor) | R0=5~200 Ω C0=0.1~0.2 μF, 200 WV | R0=5~200 Ω C0=0.1~0.2 μF, 400 WV |
| Fuse | Product certified under the UL/CSA248-14 standard or equivalent 250 VAC 10 A | Product certified under the UL/CSA248-14 standard or equivalent 250 VAC 5 A |

Precaution for wiring

- The control input terminals are not insulated from the AC power supply. Any equipment (sequencer, relay and/or switch) that will be connected to the control input terminals must have contact ratings of 18 VDC and 1 mA min. The control input terminals are not insulated from the AC power supply. Do not use a transistor output type controller.
- The length of the cable connecting the motor and speed controller should be no more than 32.8 feet (10 m).
- The length of the control cable should be no more than 6.6 feet (2 m) and as short as possible.
- Connect a surge suppressor across SW4. Oriental Motor also provides an optional **EPCR1202-2** CR circuit for surge suppression. →Page A-218

● Timing Chart

The timing chart below shows an example of switching between two speed levels 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, Stop Input 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 “Stop” (ON) during operation causes the motor to coast to a stop.
 Setting SW3 to “Brake” (ON) during operation causes the motor to stop immediately.

| Run/Stop Input | Run/Brake Input | Motor Operation |
|----------------|-----------------|-------------------|
| OFF | OFF | Runs |
| OFF | ON | Stops Immediately |
| ON | OFF | Coasts to a Stop* |

* The slow down time set with a potentiometer is longer than the time which motor coasts to a stop, motor will stop with slow down time.

The braking function (current through the motor) is only active for approximately 0.4 seconds after the Run/Brake input is turned ON. Do not switch over to SW2, SW3, SW4 for 0.5 seconds. Otherwise, damage to the speed controller may result.

● Switching the Direction of Rotation

SW4 is used to switch the motor’s direction of rotation.
 When SW4 is set to CW, the motor rotates in the clockwise direction, as seen from the motor’s output-shaft side.
 When SW4 is set to CCW, the motor rotates in the counterclockwise direction, as seen from the motor’s output-shaft side.
 The rotating direction of the gear output shaft is opposite that of the motor shaft, depends on the gear ratio.

- Instant switching between forward and reverse operations is possible with a reversible motor. Connect a surge suppressor between the relay contacts. Oriental Motor also provides an optional **EPCR1201-2** CR circuit for surge suppression. →Page A-218
- For bi-directional operation of an induction motor, switch the rotating direction after the motor has come to a complete stop.

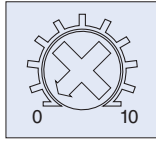
Speed Setting Methods

The following two methods of setting speed can be used. The motor does not operate in multi-motor control.

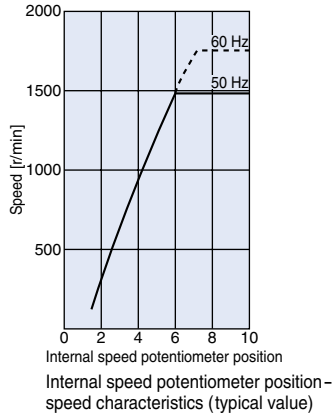
Internal Speed Potentiometer

The setting range is from 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.

Turning the potentiometer clockwise will set a faster speed. The factory setting is 0 r/min.

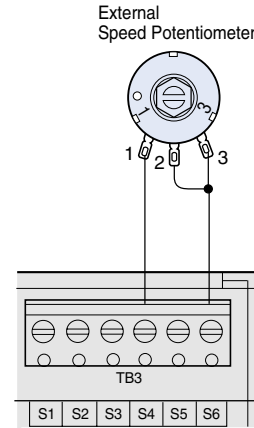


Internal Speed Potentiometer

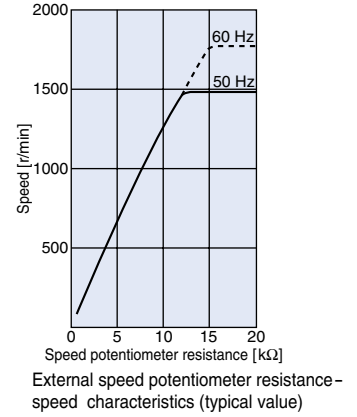


External Speed Potentiometer (included)

Open the speed potentiometer input terminals S4 and S5. Before connecting, turn the dial on the external speed potentiometer counterclockwise to set the speed to 0 r/min. Turning the dial clockwise will set a faster speed.



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



Note:

Do not operate multiple speed controllers with a single external speed potentiometer. Doing so may damage the speed controllers.

Acceleration and Deceleration Operation

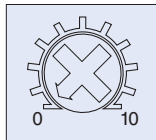
Equipment and loads are subject to large acceleration/deceleration force when starting, stopping, and changing speeds. When you want to accelerate/decelerate without any accompanying shock, the acceleration/deceleration time can be extended using the slow start/slow down function. The slow start/slow down time can be set using acceleration/deceleration time potentiometers built into the control pack. However, when the load inertia is large, the deceleration time cannot be set at a shorter time than when the motor is stopped naturally.

Acceleration

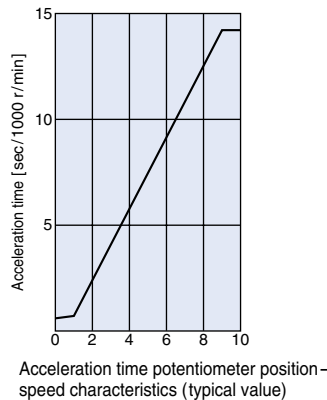
The acceleration function is actuated at start or when the speed is switched to the higher setting in a two-level speed control system.

Turning the acceleration time potentiometer clockwise will increase the set time.

The factory setting is 0 (no acceleration).



Acceleration Time Potentiometer

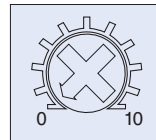


Deceleration

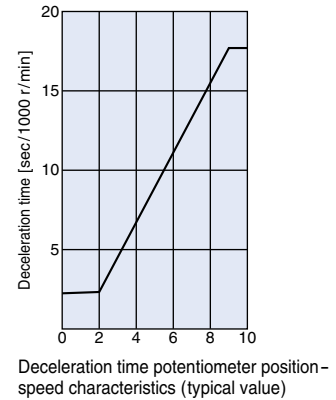
The deceleration function is actuated during natural stop or when the speed is switched to the lower setting in a two-level speed control system.

Turning the deceleration time potentiometer clockwise will increase the set time.

The factory setting is 0 (no deceleration).



Deceleration Time Potentiometer



● Repeated Operation/Braking Cycle

When running/braking of the motor is repeated in short cycles, the rise in motor temperature will increase and the continuous-operation time will be limited.

Use the following values as a guideline:

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

Note:

- The motor may generate heat, depending on the conditions in which it is driven. Ensure that the temperature of the motor case does not exceed 194°F (90°C).

● Braking Current

When the motor is commanded to stop immediately, the following braking current will flow. Provide an appropriate power supply by referring to these values.

| Motor Output | | Braking Current (Peak Value) [A] | |
|--------------|----|----------------------------------|--------------------------|
| HP | W | Single-Phase 110/115 VAC | Single-Phase 220/230 VAC |
| 1/125 | 6 | 1.5 | 1.0 |
| 1/50 | 15 | 3.5 | 2.0 |
| 1/30 | 25 | 5.5 | 3.0 |
| 1/19 | 40 | 8.5 | 6.0 |
| 1/12 | 60 | 15.5 | 8.0 |
| 1/8 | 90 | 20.5 | 12.0 |

■ List of Motor and Gearhead Combinations

Model names for motor/gearhead combinations are shown below.

● Induction Motors

| Output Power | | Model | Motor Model | Gearhead Model |
|--------------|----|-------------------|-------------|----------------|
| HP | W | | | |
| 1/125 | 6 | VSI206A-□U | VSI206A-GV | GV2G□ |
| | | VSI206C-□E | VSI206C-GV | |
| 1/50 | 15 | VSI315A-□U | VSI315A-GV | GV3G□ |
| | | VSI315C-□E | VSI315C-GV | |
| 1/30 | 25 | VSI425A-□U | VSI425A-GV | GV4G□ |
| | | VSI425C-□E | VSI425C-GV | |
| 1/19 | 40 | VSI540A-□U | VSI540A-GVH | GVH5G□ |
| | | VSI540C-□E | VSI540C-GVH | |
| 1/12 | 60 | VSI560A-□U | VSI560A-GVH | GVH5G□ |
| | | VSI560C-□E | VSI560C-GVH | |
| 1/8 | 90 | VSI590A-□U | VSI590A-GVR | GVR5G□ |
| | | VSI590C-□E | VSI590C-GVR | |

- Enter the gear ratio in the box (□) with in the model name.

● Reversible Motors

| Output Power | | Model | Motor Model | Gearhead Model |
|--------------|----|-------------------|-------------|----------------|
| HP | W | | | |
| 1/125 | 6 | VSR206A-□U | VSR206A-GV | GV2G□ |
| | | VSR206C-□E | VSR206C-GV | |
| 1/50 | 15 | VSR315A-□U | VSR315A-GV | GV3G□ |
| | | VSR315C-□E | VSR315C-GV | |
| 1/30 | 25 | VSR425A-□U | VSR425A-GV | GV4G□ |
| | | VSR425C-□E | VSR425C-GV | |
| 1/19 | 40 | VSR540A-□U | VSR540A-GVH | GVH5G□ |
| | | VSR540C-□E | VSR540C-GVH | |
| 1/12 | 60 | VSR560A-□U | VSR560A-GVH | GVH5G□ |
| | | VSR560C-□E | VSR560C-GVH | |
| 1/8 | 90 | VSR590A-□U | VSR590A-GVR | GVR5G□ |
| | | VSR590C-□E | VSR590C-GVR | |

- Enter the gear ratio in the box (□) with in the model name.