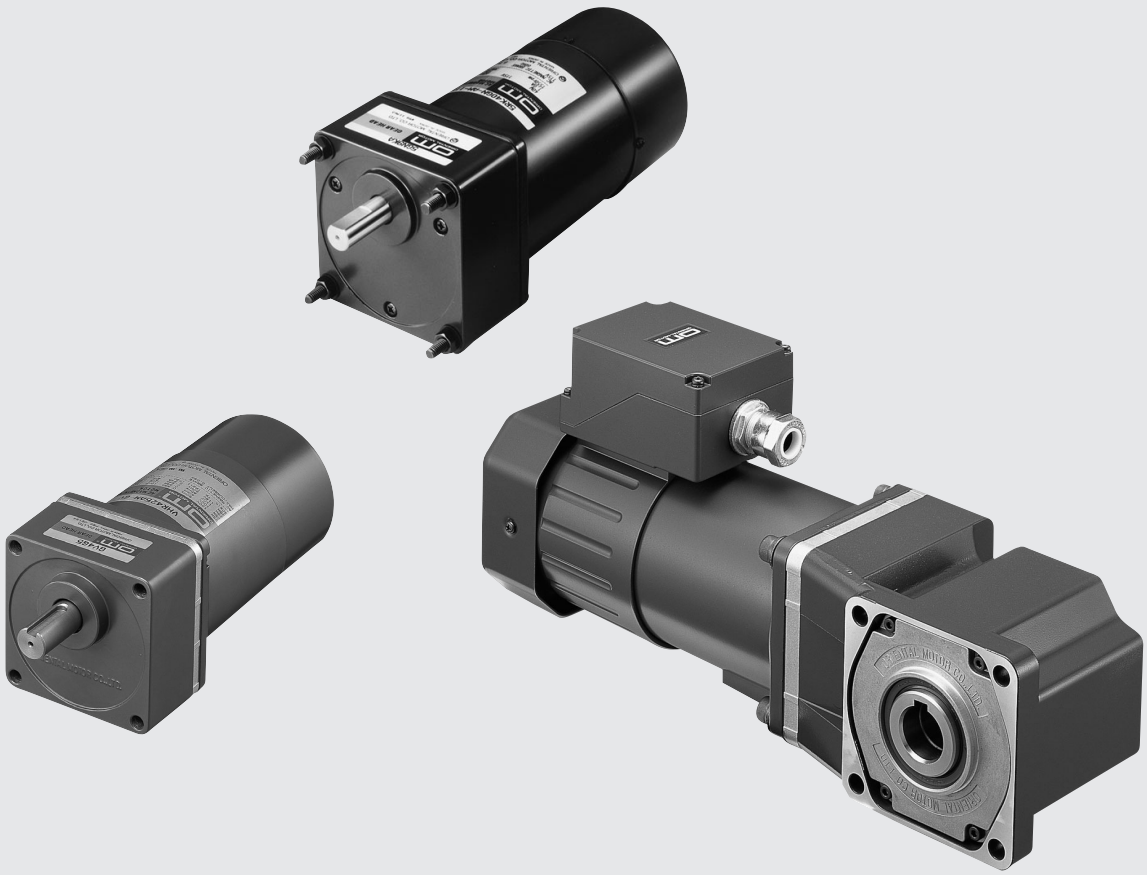


Electromagnetic Brake Motors

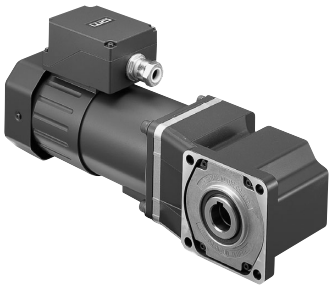
Additional Information

Power Off Activated Type

Electromagnetic Brake Motors

World **K** Series
(Lead Wire Type)

V Series
(Lead Wire Type)



BH Series
(Terminal Box Type)

✻ Gearheads shown in the photograph are sold separately. The **V** Series and the **BH** Series are Combination Type. (Pre-assembled Gearmotor)

Features

Power Off Activated Type Electromagnetic Brake

These motors are directly coupled to an AC electromagnetic brake which is activated when power is not applied. When the power source is turned off, the motor stops instantaneously and holds the load. Since the electromagnetic brakes exert holding power even while the power is off, they are highly suitable for use as emergency brakes and vertical load applications.

Conforms to Safety Standards, Conforms to Global Power Supply Voltages

Conforms to UL/CSA/EN standards and the CE Marking is being used in accordance with the low voltage directive. Also, our wide range of products includes those that meet the power supply voltages of North America, Asia and major countries in Europe.

✻ Some models are not certified by EN standard. (CE marking appears on all models)

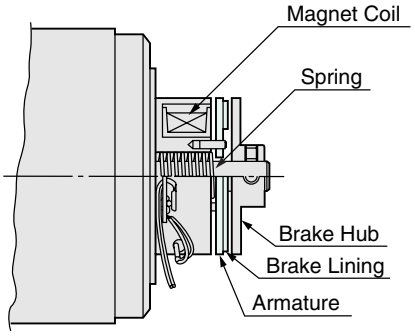
Wide Variety of Product Lines

World **K** Series, **V** Series and **BH** Series are available.

Combination Type (Pre-assembled Gearmotors) (V Series, BH Series)

The combination type (pre-assembled gearmotors) come with the motor and its dedicated gearhead already assembled. This simplifies installation in equipment. Motors and gearheads are also available separately so they can be on hand to make changes or repair.

Structure



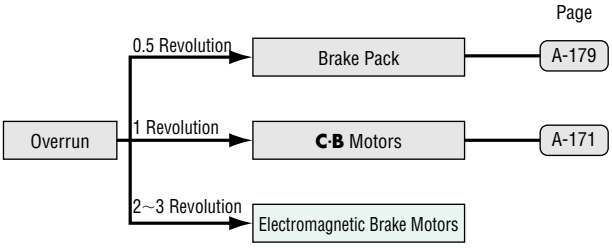
The figure above provides an example of the electromagnetic brake motors structure.
The electromagnetic brake operates on the basis of a spring which presses the armature against the brake hub, stopping the motor and holding the load. When the electromagnetic brake is excited, it attracts the armature and the brake lining is pulled away from the brake hub. The motor is then able to rotate freely.

Other Motor Braking Options

Oriental Motor provides various braking options to suit a variety of applications.

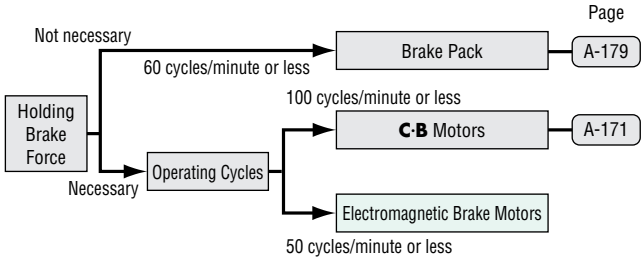
How to Select a Brake Motor

Selecting from stopping accuracy



✻ The overrun values are those of an individual motor.

Selecting based on frequency of use



Notes:

- The operating cycles are based merely on brake response. The value specified above is the maximum, so it may not be possible to repeat braking operation at this frequency.
- In an actual application, be certain the surface temperature of the motor case remains below 194˚F (90˚C) by considering a rise in motor temperature.

Safety Standards and CE Marking

World K Series, V Series

Standards	Certification Body	Standards File No.	CE Marking
UL1004 UL2111	UL	E64199 (6 W) E64197 (15 W~90 W)	Low Voltage Directives
CSA C22.2 No.100 CSA C22.2 No.77			
EN60950	VDE	114919ÜG (6 W) 6751ÜG (15 W~90 W)✻2	
	DEMKO	124234 (Three-phase 90 W)✻2	
EN60034-1 EN60034-5 IEC60034-11✻1	Conform to EN/IEC Standards		

✻1 15 W~90 W type.
✻2 Except **V** Series 90 W type.

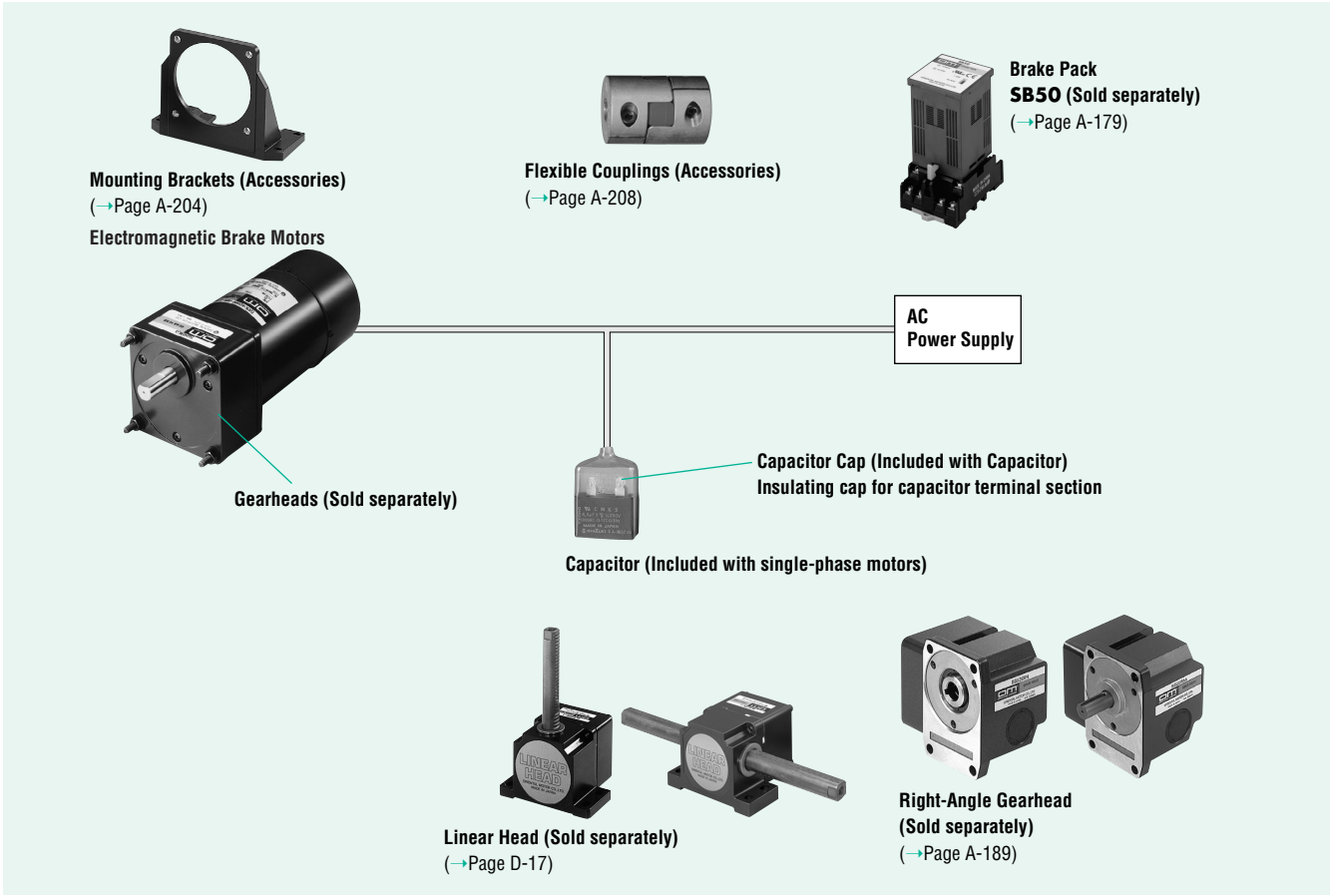
- **Details of Safety Standards**→Page G-2
- **List of Safety Standard Approved Products**→Page G-11, G-12
- When the motor is approved under various standards, the model name on the nameplate is the approved model name.

BH Series

Standards	Certification Body	Standards File No.	CE Marking
UL1004 UL2111	UL	E64197	Low Voltage Directives
CSA C22.2 No.100 CSA C22.2 No.77			
EN60950 EN60034-1 EN60034-5 IEC60034-11 IEC60664-1	Conform to EN/IEC Standards		

- **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.

System Configuration



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

Product Number Code

World K Series

4 R K 25 GN - AW M U

- **Motor Frame Size** **2**: 2.36 in. sq. (60 mm sq.) **4**: 3.15 in. sq. (80 mm sq.)
  3: 2.76 in. sq. (70 mm sq.) **5**: 3.54 in. sq. (90 mm sq.)
- **Motor Type** **I**: Induction Motor
  R: Reversible Motor
- **Motor Series** **K**: **K** series
- **Output Power**
  Example **25**: 25 W
- **Motor Shaft Type**
  GN: Pinion Shaft (for use with **GN** type gearhead)
  GU: Pinion Shaft (for use with **GU** type gearhead)
  A: Round Shaft
- **Voltage**
  AW: Single-Phase 100/110/115 VAC, 4 Poles
  CW: Single-Phase 200/220/230 VAC, 4 Poles
  SW: Three-Phase 200/220/230 VAC, 4 Poles
- **M**: Power off activated electromagnetic brake
- **Included Capacitor**
  U: For Single-Phase110/115 VAC
  E: For Single-Phase220/230 VAC
  None: Three-Phase type

Gearhead for World K Series

4 GN 50 KA

- **Gearhead Frame Size** **2**: 2.36 in. sq. (60 mm sq.) **4**: 3.15 in. sq. (80 mm sq.)
  3: 2.76 in. sq. (70 mm sq.) **5**: 3.54 in. sq. (90 mm sq.)
- **Gearhead Type**
  GN: **GN** Type (for use with **GN** type pinion shaft motor)
  GU: **GU** Type (for use with **GU** type pinion shaft motor)
- **Gear Ratio**
  (Example) **50**: Gear Ratio of 50:1
  10X denotes the decimal gearhead of gear ratio 10:1
- **Type of Bearings or Shaft Type**
  KA: Ball Bearing Type (inch size)
  RAA: Right Angle Solid Shaft Type (inch size)
  RH: Right Angle Hollow Shaft Type

Note:

- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate.

● V Series

V H R 5 40 A M - 300 U

- **Motor Series**: V series
- High Power
- **Motor Type**: I: Induction motor; R: Reversible motor
- **Motor Frame Size**: 2: 2.36 in. sq. (60 mm sq.); 3: 2.76 in. sq. (70 mm sq.); 4: 3.15 in. sq. (80 mm sq.); 5: 3.54 in. sq. (90 mm sq.)
- **Output Power** (Example) 40: 40 W
- **Voltage**: A: Single-Phase 100/110/115 VAC; C: Single-Phase 200/220/230 VAC; S: Three-Phase 200/220/230 VAC
- M: Power off activated electromagnetic brake
- **Gear Ratio** (Example) 300: Gear Ratio of 300:1
- **Included Capacitor**: U: For Single-Phase 110/115 VAC; E: For Single-Phase 220/230 VAC; None : Three-Phase type

● BH Series

BH I 6 2 F M T - 5 RH

- **Motor Series** BH:BH Series
- **Motor Type** I: Induction Motor
- **Motor Frame Size** 6: 4.09 in. sq. (104 mm sq.)
- **Output Power** 2: 200 W
- **Voltage**: F: Single-Phase 110/115 VAC; E: Single-Phase 220/230 VAC; S: Three-Phase 200/220/230 VAC
- M:Power Off Activated Electromagnetic Brake
- T: Terminal Box Type
- Number: Gear Ratio (Pre-assembled gearmotor); A: Round Shaft Type
- **Gearhead Type** (Combination Type Only): RH: Right-Angle/Hollow Shaft; RA: Right-Angle/Solid Shaft; No letter: Parallel Shaft

■ General Specifications for Motors

● World K Series, V Series

Item	Specifications
Insulation Resistance	100 MΩ or more when 500 VDC is applied between the windings and the frame after rated motor operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 1.5 kV at 50 and 60 Hz applied between the windings and the frame after rated motor operation under normal ambient temperature and humidity for 1 minute.
Temperature Rise	Temperature rise of windings are 144°F (80°C) or less measured by the resistance change method after rated motor operation with connecting a gearhead or equivalent heat radiation plate.*
Insulation Class	Class B [266°F (130°C)]
Overheat Protection Device	6 W type is impedance protected. All others have 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) [Three-Phase 200 VAC: 14°F~122°F (−10°C~+50°C)] (nonfreezing)
Ambient Humidity	85% maximum (noncondensing)
Degree of Protection	6W~40W type: IP20 60 W and 90 W type: IP40

✻Heat radiation plate (material: Aluminum)

Type (output)	Size: in. (mm)	Thickness: in. (mm)
2IK, **2RK** Type (6 W)	4.53×4.53 (115×115)	0.20 (5)
3RK Type (15 W)	4.92×4.92 (125×125)	
4IK, **4RK** Type (25 W)	5.31×5.31 (135×135)	
5IK40, **5RK40** Type (40 W)	6.50×6.50 (165×165)	
5IK60, **5RK60** Type (60 W)	7.87×7.87 (200×200)	
5IK90, **5RK90** Type (90 W)	7.87×7.87 (200×200)	

● BH Series

Item	Specifications
Insulation Resistance	100 MΩ or more when 500 VDC is applied between the windings and the frame after rated motor operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 1.5 kV at 50 Hz and 60 Hz applied between the windings and the frame for 1 minute after rated motor operation under normal ambient temperature and humidity.
Temperature Rise	Temperature rise of windings are 126°F (70°C) or less measured by the resistance change method after rated motor operation with connecting a gearehead or equivalent heat radiation plate.
Insulation Class	Class B [266°F (130°C)]
Overheat Protection	Built-in thermal protector (Automatic return type) Operating temperature, open: 302°F±9°F (150°C±5°C) close: 204.8°F±27°F (96°C±15°C)
Ambient Temperature Range	14°F~104°F (−10°C~+40°C) [Three-Phase 200 VAC: 14°F~122°F (−10°C~+50°C)] (nonfreezing)
Ambient Humidity	85% maximum (noncondensing)
Degree of Protection	IP54

✻ Heat Radiation Plate 9.06 inch×9.06 inch (230 mm×230 mm), 0.20 inch (5 mm) thickness (Material: Aluminum).

Power Off Activated Type Electromagnetic Brake Motors

6 W (1/125 HP)

Frame Size: □ 2.36 in. (□ 60 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications — 30 Minute Rating

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
ZP **2RK6GN-AWMU**	**2RK6A-AWMU**	1/125	6	Single-Phase 110	60	0.25	6.3	45	5.8	41	1450	3.5
				Single-Phase 115		0.26						
ZP **2RK6GN-CWME**	**2RK6A-CWME**			Single-Phase 220	50	0.12	7.1	50	6.9	49	1200	0.8
				Single-Phase 220	60	0.11	6.3	45	5.8	41	1450	
				Single-Phase 230	50	0.12	7.1	50	6.9	49	1200	
				Single-Phase 230	60	0.12	6.3	45	5.8	41	1450	
ZP **2IK6GN-SWM**	**2IK6A-SWM**			Three-Phase 200	50	0.09	6.9	49	6.9	49	1200	—
				Three-Phase 200	60	0.08	5.8	41	5.8	41	1450	
				Three-Phase 220	60	0.09	5.8	41	5.8	41	1500	
				Three-Phase 230	60	0.09	5.8	41	5.8	41	1500	

ZP Impedance protected.
- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model names on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
ZP **VHR206AM-□U**	1/125	6	Single-Phase 110	60	0.25	6.3	45	5.8	41	1450	3.5
			Single-Phase 115		0.26						
ZP **VHR206CM-□E**			Single-Phase 220	50	0.12	7.1	50	6.9	49	1200	0.8
			Single-Phase 220	60	0.11	6.3	45	5.8	41	1450	
			Single-Phase 230	50	0.12	7.1	50	6.9	49	1200	
			Single-Phase 230	60	0.12	6.3	45	5.8	41	1450	

ZP Impedance protected.
- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model names on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	mN·m
2RK6GN-AWMU **2RK6A-AWMU**	Single-Phase 110	60	0.03	3	4.2	30
	Single-Phase 115	60				
2RK6GN-CWME **2RK6A-CWME**	Single-Phase 220	50	0.02	3	4.2	30
	Single-Phase 220	60				
	Single-Phase 230	50				
	Single-Phase 230	60				
2IK6GN-SWM **2IK6A-SWM**	Single-Phase 220	50	0.02	3	4.2	30
	Single-Phase 220	60				
	Single-Phase 230	60				

◆ V Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	mN·m
VHR206AM-□U	Single-Phase 110	60	0.03	3	4.2	30
	Single-Phase 115	60				
VHR206CM-□E	Single-Phase 220	50	0.02	3	4.2	30
	Single-Phase 220	60				
	Single-Phase 230	50				
	Single-Phase 230	60				

- The values in the table are for the motor only.

■ Gearheads for World K Series (Sold Separately)

● Parallel Shaft

Gearhead Model	Gear Ratio
2GN□KA	**3~180**
2GN10XK (Decimal Gearhead)	

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

Gearmotor — Torque Table

World K Series (General Purpose)

The maximum permissible torque with a decimal gearhead with a gear ratio of 10:1 is 26 lb-in (3 N·m).

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	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**
2RK6GN-AWMU 2RK6GN-CWME 2IK6GN-SWM / 2GN□KA		0.88 0.1	1.06 0.12	1.5 0.17	1.77 0.20	2.2 0.25	2.6 0.30	3.7 0.42	4.4 0.50	5.3 0.6	6.6 0.75	7.9 0.90	9.7 1.1	12.3 1.4	14.1 1.6	17.7 2.0	21 2.4	23 2.7	26 3	26 3	26 3

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
	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**
2RK6GN-CWME 2IK6GN-SWM / 2GN□KA		1.06 0.12	1.23 0.14	1.77 0.20	2.1 0.24	2.6 0.30	3.1 0.36	4.4 0.50	5.3 0.60	6.2 0.71	7.8 0.89	9.7 1.1	11.5 1.3	14.1 1.6	16.8 1.9	21 2.4	25 2.9	26 3	26 3	26 3	26 3

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115/230 VAC 60 Hz

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

Model	Speed r/min	360	300	200	120	100	60	50	30	20	15	10	6	5
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR206AM-□U VHR206CM-□E		1.59 0.18	1.94 0.22	2.9 0.33	4.8 0.55	5.8 0.66	9.7 1.1	11.5 1.3	18.5 2.1	28 3.2	37 4.2	53 6	53 6	53 6

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3	5	4.2
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR206CM-□E		1.94 0.22	2.3 0.26	3.5 0.4	5.8 0.66	6.9 0.79	11.5 1.3	13.2 1.5	22 2.5	33 3.8	45 5.1	53 6	53 6	53 6

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2～20% less than the displayed value, depending on the size of the load.

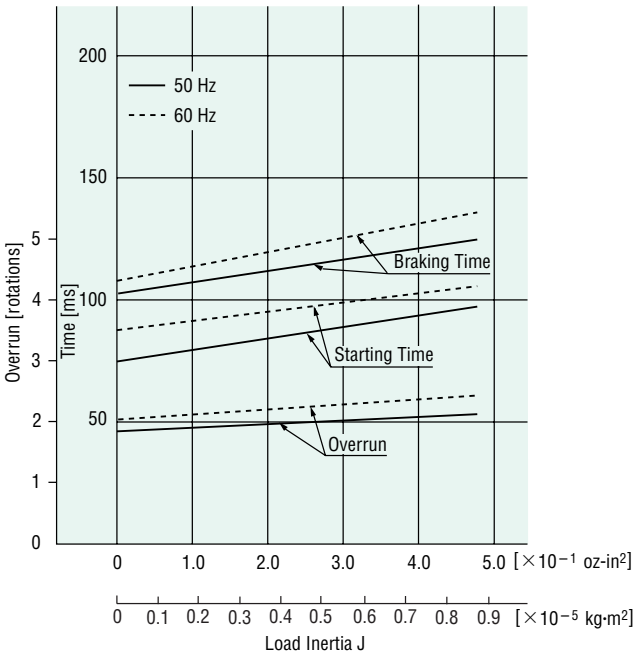
Permissible Overhung Load and Permissible Thrust Load

Motor (Round shaft motor)→Page A-11
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

→Page A-12

Starting and Braking Characteristics Common to 6W Type (Reference Values)



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

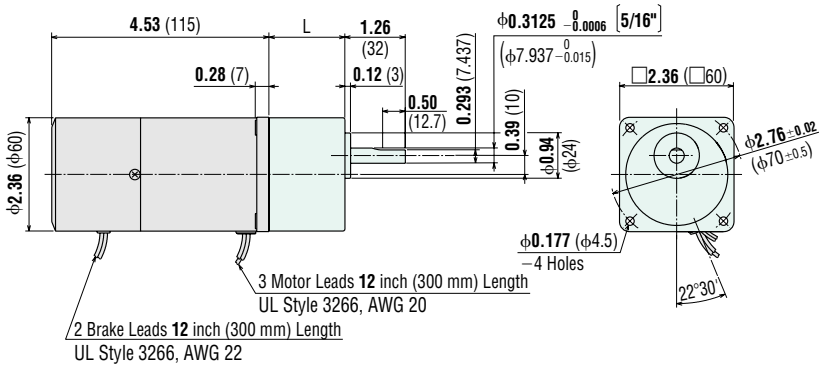
Mounting screws are included with gearheads. Dimensions for screws→A-223

World K Series

Motor
2RK6GN-AWMU
2RK6GN-CWME
2IK6GN-SWM
Weight: 2.0 lb. (0.9 kg)

Gearhead
2GN□KA
Weight: 0.88 lb. (0.4 kg)

DXF A086AU (**2GN3KA**~**18KA**)
A086BU (**2GN25KA**~**180KA**)

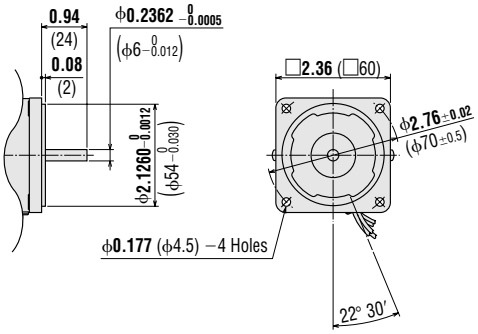


2GN3KA~**18KA**: L = **1.18** (30)
2GN25KA~**180KA**: L = **1.57** (40)

Round Shaft Type
2RK6A-AWMU
2RK6A-CWME
2IK6A-SWM
Weight: 2.0 lb. (0.9 kg)

DXF A346

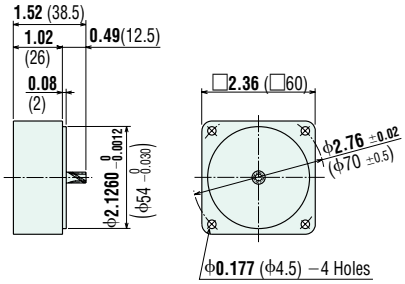
1/4 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.



Decimal Gearhead (for World K Series)

2GN10XK Weight: 0.44 lb. (0.2 kg)

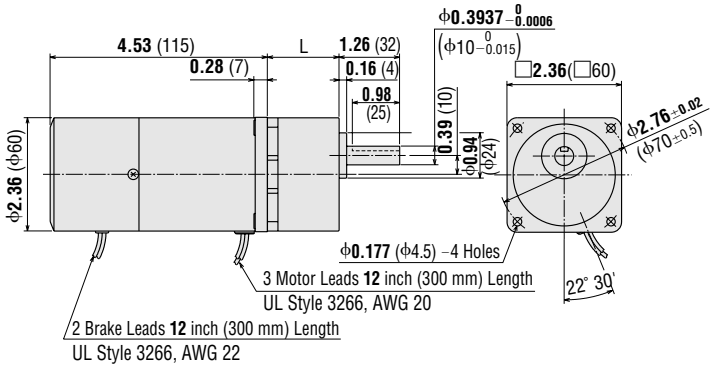
DXF A003



V Series

VHR206AM-□U, **VHR206CM-□E** (Combination Type)
Weight: 3.1 lb. (1.4 kg) including gearhead
Motor Model: VHR206AM-GV, VHR206CM-GV
Gearhead Model: GV2G□

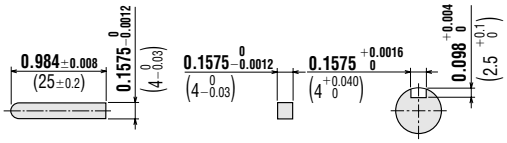
DXF A213A (GV2G5~18)
A213B (GV2G30~120)
A213C (GV2G180~360)



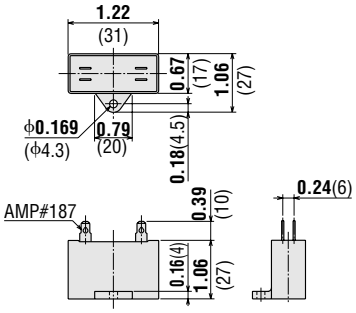
GV2G5~GV2G18: L = **1.34** (34)
GV2G30~GV2G120: L = **1.5** (38)
GV2G180~GV2G360: L = **1.69** (43)

●Key and Key Slot (Scale 1/2)

(The key is included with the gearhead)



Capacitor (included with single-phase motors)



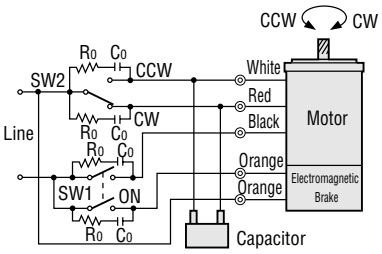
Motor Model	Capacitor Model	Weight oz. (g)
2RK6GN-AWMU **2RK6A-AWMU** **VHR206AM-□U**	CH35FAUL	0.88 (25)
2RK6GN-CWME **2RK6A-CWME** **VHR206CM-□E**	CH08BFAUL	0.88 (25)

- 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 Diagrams

Single-Phase Motor

2RK6GN-AWMU
2RK6GN-CWME
VHR206AM-□U
VHR206CM-□U



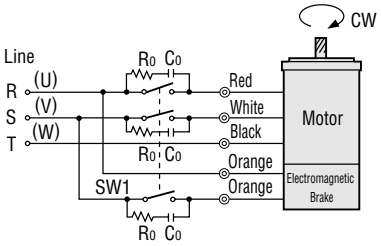
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 3 A minimum (Inductive Load)	250 VAC 1.5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—

Three-Phase Motor

2IK6GN-SWM



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

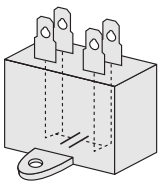
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

Switch No.	Specifications	Note
SW1	250 VAC 1.5 A minimum (Inductive Load)	Switched Simultaneously

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR206AM-□U	VHR206AM-GV	GV2G□
VHR206CM-□E	VHR206CM-GV	

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

Power Off Activated Type Electromagnetic Brake Motors

15 W (1/50 HP)

Frame Size: □ 2.76 in. (□ 70 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications — 30 Minute Rating

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **3RK15GN-AWMU**	**3RK15A-AWMU**	1/50	15	Single-Phase 110	60	0.42	14.2	100	14.9	105	1450	6
				Single-Phase 115		0.41						
(TP) **3RK15GN-CWME**	**3RK15A-CWME**			Single-Phase 220	50	0.19	14.2	100	17.7	125	1200	1.5
				Single-Phase 220	60	0.21	14.2	100	14.9	105	1450	
				Single-Phase 230	50	0.20	14.2	100	17.7	125	1200	
				Single-Phase 230	60	0.21	14.2	100	14.9	105	1450	

(TP) Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **VHR315AM-□U**	1/50	15	Single-Phase 110	60	0.42	14.2	100	14.9	105	1450	6
			Single-Phase 115		0.41						
(TP) **VHR315CM-□E**			Single-Phase 220	50	0.19	14.2	100	17.7	125	1200	1.5
			Single-Phase 220	60	0.21			14.9	105	1450	
			Single-Phase 230	50	0.20			17.7	125	1200	
			Single-Phase 230	60	0.16			14.9	105	1450	

(TP) Contains 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 "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
3RK15GN-AWMU **3RK15A-AWMU**	Single-Phase 110	60	0.06	4	11.3	80
	Single-Phase 115	60				
3RK15GN-CWME **3RK15A-CWME**	Single-Phase 220	50	0.05	7	11.3	80
	Single-Phase 220	60				
	Single-Phase 230	50				
	Single-Phase 230	60				

◆ V Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
VHR315AM-□U	Single-Phase 110	60	0.09	7	11.3	80
	Single-Phase 115	60				
VHR315CM-□E	Single-Phase 220	50	0.05	7	11.3	80
	Single-Phase 220	60				
	Single-Phase 230	50				
	Single-Phase 230	60				

- The values in the table are for the motor only.

■ Gearheads for World K Series (Sold Separately)

● Parallel Shaft

Gearhead Model	Gear Ratio
3GN□KA	**3~180**
3GN10XK (Decimal Gearhead)	

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

Gearmotor — Torque Table

World K Series (Gemeral Purpose)

The maximum permissible torque with a decimal gearhead with a gear ratio of 10:1 is 44 lb-in (5 N·m).

Single-Phase 115/230 VAC 60 Hz

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

Model	Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	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**
3RK15GN-AWMU / 3RK15GN-CWME / 3GN□KA		2.3 0.26	2.7 0.31	3.8 0.43	4.5 0.51	5.6 0.64	6.8 0.77	9.7 1.1	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	44 5	44 5	44 5	44 5	44 5

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	15	18	12.5	10	8.3
	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**
3RK15GN-CWME / 3GN□KA		2.6 0.30	3.1 0.36	4.5 0.51	5.4 0.61	6.7 0.76	8 0.91	11.5 1.3	13.2 1.5	15.9 1.8	20 2.3	23.4 2.7	29 3.3	36 4.1	44 5	44 5	44 5	44 5	44 5	44 5	44 5

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115/230 VAC 60 Hz

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

Model	Speed r/min	360	300	200	120	100	60	50	30	20	15	10	6	5
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR315AM-□U / VHR315CM-□E		4.1 0.47	5 0.57	7.5 0.85	12.3 1.4	15 1.7	23 2.7	29 3.3	47 5.4	71 8.1	88 10	88 10	88 10	88 10

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3	5	4.2
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR315CM-□E		4.9 0.56	6 0.68	8.8 1.0	15 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

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2～20% less than the displayed value, depending on the size of the load.

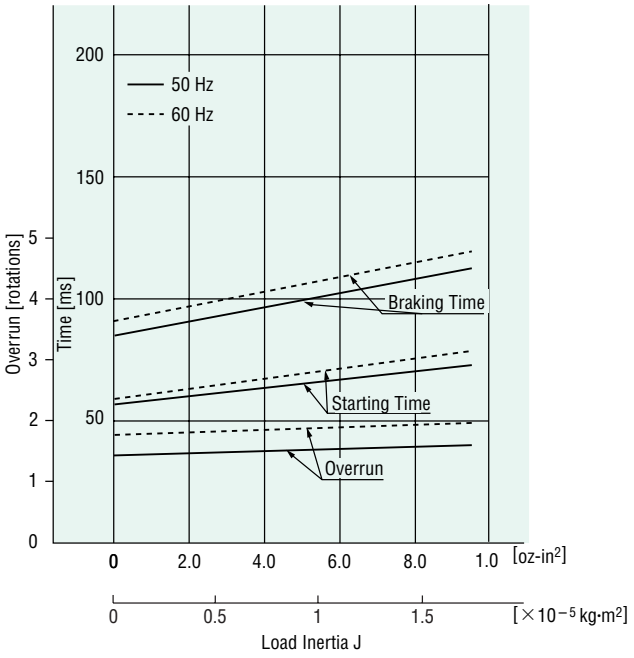
Permissible Overhung Load and Permissible Thrust Load

Motor (Round shaft motor)→Page A-11
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

→Page A-12

Starting and Braking Characteristics Common to 15W Type (Reference Values)



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

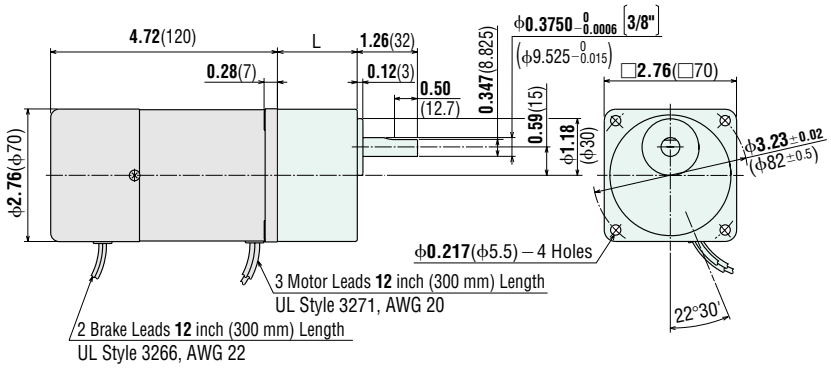
Mounting screws are included with gearheads. Dimensions for screws→A-223

World K Series

Motor
3RK15GN-AWMU
Weight: 2.9 lb. (1.3 kg)

Gearhead
3GN□KA
Weight: 1.2 lb. (0.55 kg)

DXF A087AU (**3GN3KA**~**18KA**)
A087BU (**3GN25KA**~**180KA**)



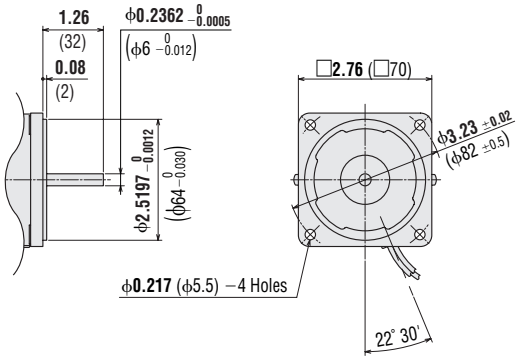
3GN3KA~**18KA**: L = **1.26** (32)
3GN25KA~**180KA**: L = **1.65** (42)

Round Shaft Type

3RK15A-AWMU
Weight: 2.9 lb. (1.3 kg)

DXF A347

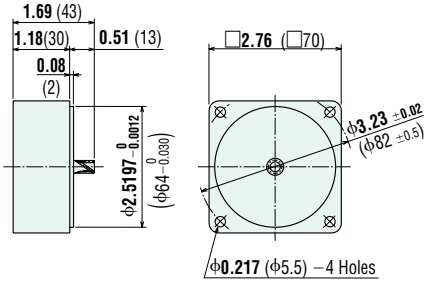
1/4 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.



Decimal Gearhead (for World K Series)

3GN10XK Weight: 0.66 lb. (0.3 kg)

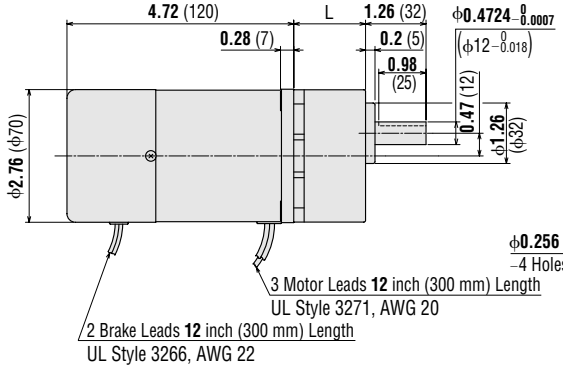
DXF A009

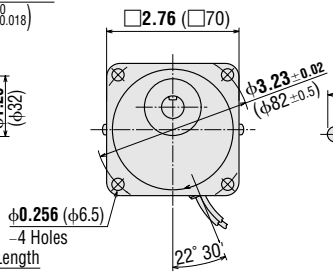


V Series

VHR315AM-□U, **VHR315CM-□E** (Combination Type)
Weight: 4.2 lb. (1.9 kg) including gearhead
Motor Model: VHR315AM-GV, VHR315CM-GV
Gearhead Model: GV3G□

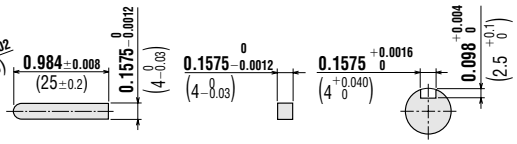
DXF A391A (GV3G5~18)
A391B (GV3G30~120)
A391C (GV3G180~360)





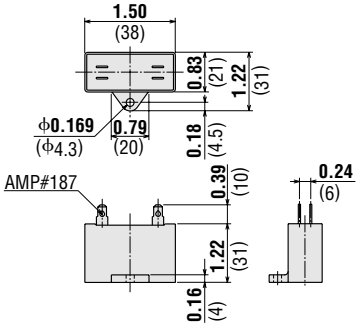
●Key and Key Slot (Scale 1/2)

(The key is included with the gearhead)



GV3G5~GV3G18: L = **1.5** (38)
GV3G30~GV3G120: L = **1.69** (43)
GV3G180~GV3G360: L = **1.89** (48)

Capacitor (included with the motors)

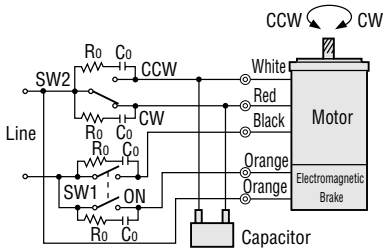


Motor Model	Capacitor Model	Weight oz. (g)
3RK15GN-AWMU **3RK15A-AWMU** **VHR315AM-□U**	CH60CFAUL	1.4 (40)
3RK15GN-CWME **3RK15A-CWME** **VHR315CM-□E**	CH15BFAUL	1.2 (35)

- 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 Diagrams

3RK15GN-AWMU
3RK15GN-CWME
VHR315AM-□U
VHR315CM-□E



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

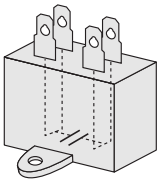
Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 3 A minimum	250 VAC 1.5 A minimum	Switched Simultaneously
SW2	(Inductive Load)	(Inductive Load)	—

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR315AM-□U	VHR315AM-GV	GV3G□
VHR315CM-□E	VHR315CM-GV	

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

Power Off Activated Type Electromagnetic Brake Motors

25 W (1/30 HP)

Frame Size: □ 3.15 in. (□ 80 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **4RK25GN-AWMU**	**4RK25A-AWMU**	1/30	25	Single-Phase 110 Single-Phase 115	60	0.54	19.8	140	24	170	1450	8
(TP) **4RK25GN-CWME**	**4RK25A-CWME**			Single-Phase 220	60	0.28	19.8	140	24	170	1450	
				Single-Phase 230	50	0.26	22	160	29	205	1200	2
				Single-Phase 230	60	0.28	19.8	140	24	170	1450	
(TP) **4IK25GN-SWM**	**4IK25A-SWM**			Three-Phase 200	50	0.23	34	240	26	190	1300	
				Three-Phase 200	60	0.21	22	160	22	160	1550	—
				Three-Phase 220	60	0.21	22	160	22	160	1600	
				Three-Phase 230	60	0.22	22	160	22	160	1600	

(TP) Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **VHR425AM-□U**	1/30	25	Single-Phase 110 Single-Phase 115	60	0.54	19.8	140	24	170	1450	8
(TP) **VHR425CM-□E**			Single-Phase 220	60	0.28	19.8	140	24	170	1450	
			Single-Phase 230	50	0.26	22	160	29	205	1200	2
			Single-Phase 230	60	0.28	19.8	140	24	170	1450	
(TP) **VHI425SM-□**			Three-Phase 200	50	0.23	34	240	26	190	1300	
			Three-Phase 200	60	0.21	22	160	22	160	1550	—
			Three-Phase 220	60	0.21	22	160	22	160	1600	
			Three-Phase 230	60	0.22	22	160	22	160	1600	

(TP) Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
4RK25GN-AWMU **4RK25A-AWMU**	Single-Phase 110 Single-Phase 115	60	0.08	5 6	14.2	100
4RK25GN-CWME **4RK25A-CWME**	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.05	7	14.2	100
4IK25GN-SWM **4IK25A-SWM**	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 50 60	0.05	5 5 6 6	14.2	100

◆ V Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
VHR425AM-□U	Single-Phase 110 Single-Phase 115	60	0.08	5 6	14.2	100
VHR425CM-□E	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.05	7	14.2	100
VHI425SM-□	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 60 60	0.04 0.04 0.04 0.05	5 5 6 6	14.2	100

- The values in the table are for the motor only.

Gearheads for World K Series (Sold Separately)

Parallel Shaft

Gearhead Model	Gear Ratio
4GN□KA	**3～180**
4GN10XK (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**
Solid Shaft	**4GN□RAA**	**3.6～180**

- Enter the gear ratio in the box (□) within the model name.
- **Right-Angle Gearheads**→Page A-189

Gearmotor — Torque Table

World K Series (General Purpose)

The maximum permissible torque with a decimal gearhead with a gear ratio of 10:1 is 70 lb-in (8 N·m).
The value is 53 lb-in (6 N·m) when 25:1～36:1 gearheads are connected.

Single-Phase115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	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**
4RK25GN-AWMU 4RK25GN-CWME / **4GN□KA**		3.6	4.4	6.1	7.3	8.8	10.6	15	18.5	22	27	32	39	49	59	70	70	70	70	70	70
		0.41	0.50	0.69	0.83	1.0	1.2	1.7	2.1	2.5	3.1	3.7	4.5	5.6	6.7	8	8	8	8	8	8
4IK25GN-SWM / **4GN□KA**		3.4	4.1	5.7	6.9	8.5	10.6	14.1	16.8	20	25	30	37	46	55	69	70	70	70	70	70
		0.39	0.47	0.65	0.78	0.97	1.2	1.6	1.9	2.3	2.9	3.5	4.2	5.3	6.3	7.9	8	8	8	8	8

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	500	416	300	250	200	166	120	100	83	60	.50	41	30	25	20	16	15	12.5	10	8.3
	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**
4RK25GN-CWME 4GN□KA		4.4	5.3	7.3	8.8	10.6	13.2	18.5	22	26	32	39	47	60	70	70	70	70	70	70	70
		0.5	0.6	0.83	1.0	1.2	1.5	2.1	2.5	3.0	3.7	4.5	5.4	6.8	8	8	8	8	8	8	8

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	360	300	200	120	100	60	50	30	20	15	10	6	5
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR425AM-□U VHR425CM-□E		6.8	8.1	12.3	20	24	38	46	77	116	141	141	141	141
		0.77	0.92	1.4	2.3	2.8	4.4	5.3	8.8	13.2	16	16	16	16
VHI425SM-□		6.3	7.6	11.5	19.4	23	36	44	73	109	141	141	141	141
		0.72	0.86	1.3	2.2	2.6	4.1	5.0	8.3	12.4	16	16	16	16

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3	5	4.2
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**	**360**
VHR425CM-□E		8.1	9.7	15	24	29	46	55	93	140	141	141	141	141
		0.92	1.1	1.7	2.8	3.3	5.3	6.3	10.6	15.9	16	16	16	16

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2～20% less than the displayed value, depending on the size of the load.

Dimensions A-144 | Connection Diagrams A-146 | List of Motor and Gearhead Combinations for V Series A-146

Gearmotor — Torque Table when Right-Angle Gearhead is Attached

Right-Angle Gearheads are available for the World **K** Series only.
→Page A-196

Permissible Overhung Load and Permissible Thrust Load

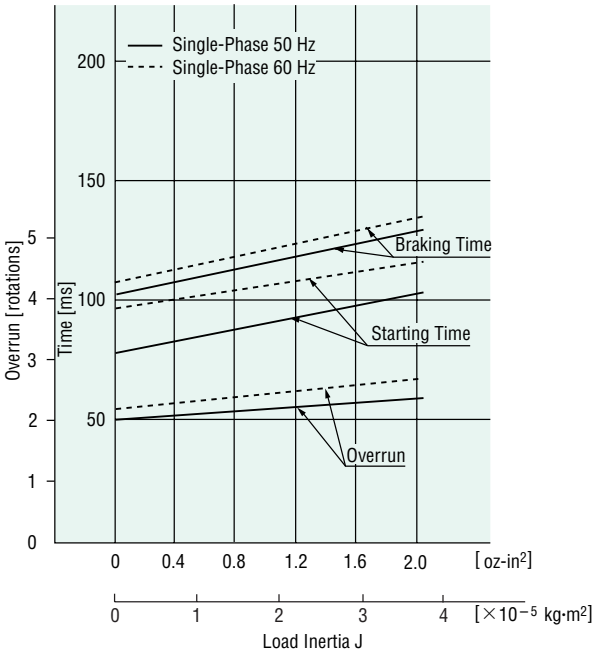
Motor (Round shaft motor)→Page A-11
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

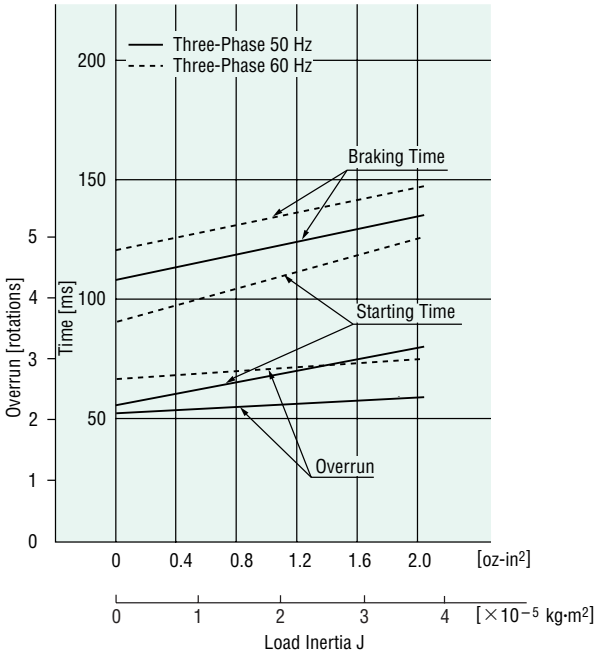
→Page A-12

Starting and Braking Characteristics Common to 25W Type (Reference Values)

Single-Phase Motor



Three-Phase Motor



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

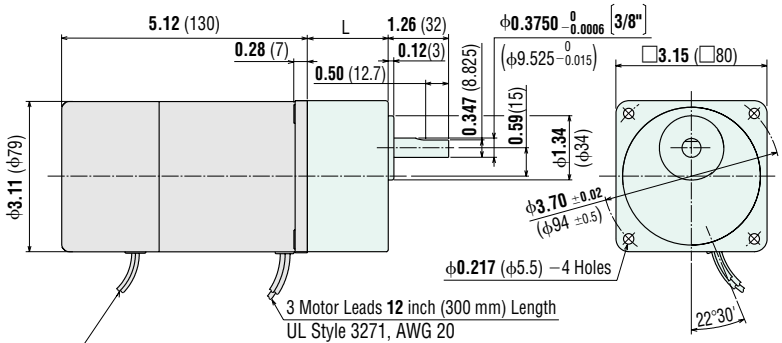
Mounting screws are included with gearheads. Dimensions for screws→A-223

World K Series

Motor
4RK25GN-AWMU
4RK25GN-CWME
4IK25GN-SWM
Weight: 4.4 lb. (2.0 kg)

Gearhead
4GN□KA
Weight: 1.4 lb. (0.65 kg)

DXF A088AU (**4GN3KA**~**18KA**)
A088BU (**4GN25KA**~**180KA**)

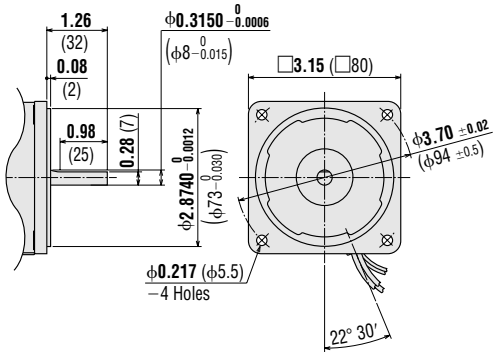


4GN3KA~**18KA**: L = **1.26** (32)
4GN25KA~**180KA**: L = **1.67** (42.5)

Round Shaft Type
4RK25A-AWMU
4RK25A-CWME
4IK25A-SWM
Weight: 4.4 lb. (2.0 kg)

DXF A348

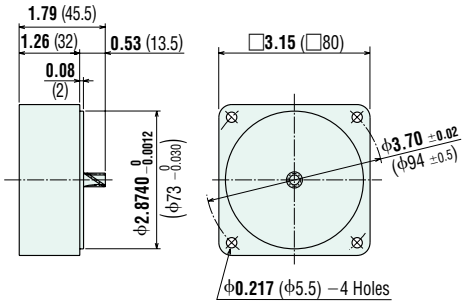
5/16 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.



Decimal Gearhead (for World K Series)

4GN10XK Weight: 0.88 lb. (0.4 kg)

DXF A013



V Series

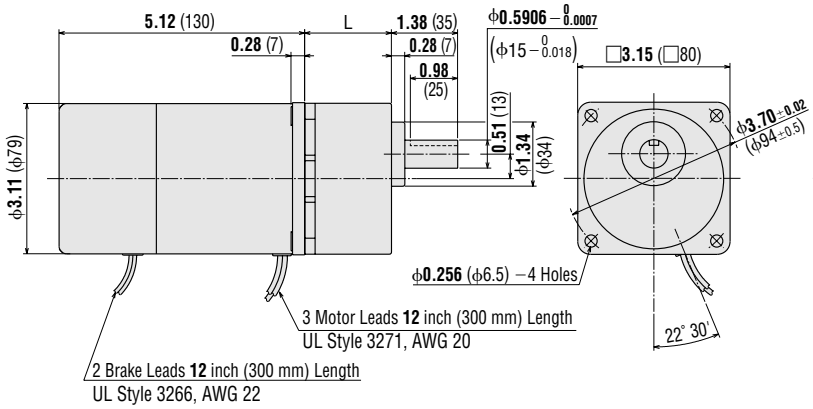
VHR425AM-□U, **VHR425CM-□E**, **VHI425SM-□** (Combination Type)

Weight: 6.6 lb. (3.0 kg)

Motor Model: VHR425AM-GV, VHR425CM-GV, VHI425SM-GV

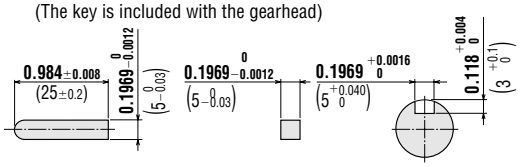
Gearhead Model: GV4G□

DXF A214A (GV4G5~18)
A214B (GV4G30~120)
A214C (GV4G180~360)



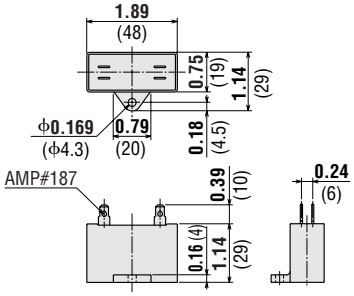
Key and Key Slot (Scale 1/2)

(The key is included with the gearhead)



GV4G5~GV4G18: L = **1.61** (41)
GV4G30~GV4G120: L = **1.81** (46)
GV4G180~GV4G360: L = **2.01** (51)

Capacitor (included with single-phase motors)



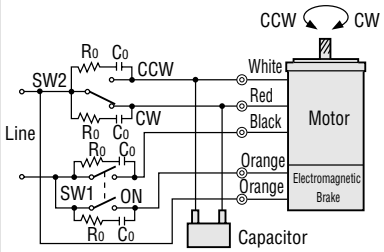
Motor Model	Capacitor Model	Weight oz. (g)
4RK25GN-AWMU **4RK25A-AWMU** **VHR425AM-□U**	CH80CFAUL	1.4(40)
4RK25GN-CWME **4RK25A-CWME** **VHR425CM-□E**	CH20BFAUL	1.2 (35)

- 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 Diagrams

Single-Phase Motor

4RK25GN-AWMU
4RK25GN-CWME
VHR425AM-□U
VHR425CM-□U



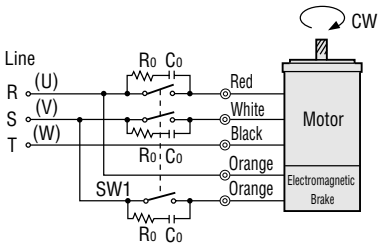
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(If you wish to release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 3 A minimum (Inductive Load)	250 VAC 1.5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—

Three-Phase Motor

4IK25GN-SWM
VHI425SM-□



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(If you wish to release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

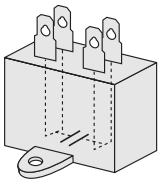
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

Switch No.	Specifications	Note
SW1	250 VAC 1.5 A minimum (Inductive Load)	Switched Simultaneously

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR425AM-□U	VHR425AM-GV	GV4G□
VHR425CM-□E	VHR425CM-GV	
VHI425SM-□	VHI425SM-GV	

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

Power Off Activated Type Electromagnetic Brake Motors

40 W (1/19 HP)

Frame Size: □ 3.54 in. (□ 90 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
ⓉⓅ**5RK40GN-AWMU**	**5RK40A-AWMU**	1/19	40	Single-Phase 110 Single-Phase 115	60	0.81	36	260	38	270	1450	12
ⓉⓅ**5RK40GN-CWME**	**5RK40A-CWME**			Single-Phase 220	60	0.46	36	260	36	260	1500	3.5
				Single-Phase 230	50	0.40	38	270	44	315	1250	
				Single-Phase 230	60	0.46	36	260	36	260	1500	
ⓉⓅ**5IK40GN-SWM**	**5IK40A-SWM**			Three-Phase 200	50	0.32	56	400	42	300	1300	—
				Three-Phase 200	60	0.30	36	260	36	260	1550	
				Three-Phase 220	60	0.30	36	260	36	260	1600	
				Three-Phase 230	60	0.31	36	260	36	260	1600	

ⓉⓅContains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
ⓉⓅ**VHR540AM-□U**	1/19	40	Single-Phase 110 Single-Phase 115	60	0.81	36	260	38	270	1450	12
ⓉⓅ**VHR540CM-□E**			Single-Phase 220	60	0.46	36	260	36	260	1500	3.5
			Single-Phase 230	50	0.40	38	270	44	315	1250	
			Single-Phase 230	60	0.46	36	260	36	260	1500	
ⓉⓅ**VHI540SM-□**			Three-Phase 200	50	0.32	56	400	42	300	1300	—
			Three-Phase 200	60	0.30	36	260	36	260	1550	
			Three-Phase 220	60	0.30	36	260	36	260	1600	
			Three-Phase 230	60	0.31	36	260	36	260	1600	

ⓉⓅContains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage	Frequency	Current	Input	Holding Brake Torque	
	VAC	Hz	A	W	oz-in	mN·m
5RK40GN-AWMU **5RK40A-AWMU**	Single-Phase 110	60	0.08	6	28	200
	Single-Phase 115	60	0.09	7		
5RK40GN-CWME **5RK40A-CWME**	Single-Phase 220	60	0.04	6	28	200
	Single-Phase 230	50				
	Single-Phase 230	60				
5IK40GN-SWM **5IK40A-SWM**	Single-Phase 200	50	0.04	5	28	200
	Single-Phase 200	60		5		
	Single-Phase 220	60		6		
	Single-Phase 230	60		6		

◆ V Series

Model	Voltage	Frequency	Current	Input	Holding Brake Torque	
	VAC	Hz	A	W	oz-in	mN·m
VHR540AM-□U	Single-Phase 110	60	0.08	6	28	200
	Single-Phase 115		0.09	7		
VHR540CM-□E	Single-Phase 220	60	0.04	6	28	200
	Single-Phase 230	50				
	Single-Phase 230	60				
VHI540SM-□	Single-Phase 200	50	0.04	5	28	200
	Single-Phase 200	60		5		
	Single-Phase 220	60		6		
	Single-Phase 230	60		6		

- The values in the table are for the motor only.

Dimensions A-149 | Connection Diagrams A-151 | List of Motor and Gearhead Combinations for V Series A-151

Gearheads for World K Series (Sold Separately)

Parallel Shaft

Gearhead Model	Gear Ratio
5GN□KA	**3~180**
5GN10XK (Decimal Gearhead)	

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

Right-Angle

Type	Gearhead Model	Gear Ratio
Hollow Shaft	**5GN□RH**	**3.6~180**
Solid Shaft	**5GN□RAA**	**3~180**

- Enter the gear ratio in the box (□) within the model name.
- **Right-Angle Gearheads**→Page A-189

Gearmotor — Torque Table

World K Series (General Purpose)

The maximum permissible torque with a decimal gearhead with a gear ratio of 10:1 is 88 lb-in (10 N·m).

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	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**
5RK40GN-AWMU / **5GN□KA**		5.8 0.66	6.9 0.79	9.7 1.1	11.5 1.3	14.1 1.6	17.7 2.0	23 2.7	29 3.3	34 3.9	43 4.9	52 5.9	62 7.1	78 8.9	88 10	88 10	88 10	88 10	88 10	88 10	88 10	88 10
5RK40GN-CWME **5IK40GN-SWM** / **5GN□KA**		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

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
	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**
5RK40GN-CWME / **5GN□KA**		6.8 0.77	8.1 0.92	11.5 1.3	13.2 1.5	16.8 1.9	20 2.3	28 3.2	33 3.8	40 4.6	50 5.7	61 6.9	73 8.3	88 10	88 10	88 10	88 10	88 10	88 10	88 10	88 10

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	360	300	200	120	100	60	50	30	20	15	10	6
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**
VHR540AM-□U		10.6 1.2	13.2 1.5	19.4 2.2	31 3.6	38 4.4	61 7	74 8.4	123 13.9	184 20.9	230 26.2	260 30	260 30
VHR540CM-□U		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	220 25.3	260 30	260 30
VHI540SM-□		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	220 25.3	260 30	260 30

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3	5
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**
VHR540CM-□E		12.3 1.4	15 1.7	23 2.6	38 4.3	45 5.1	71 8.1	86 9.8	144 16.3	210 24.4	260 30	260 30	260 30

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2~20% less than the displayed value, depending on the size of the load.

Gearmotor — Torque Table when Right-Angle Gearhead is Attached

Right-Angle Gearheads are available for the World **K** Series only.

→Page A-196

Permissible Overhung Load and Permissible Thrust Load

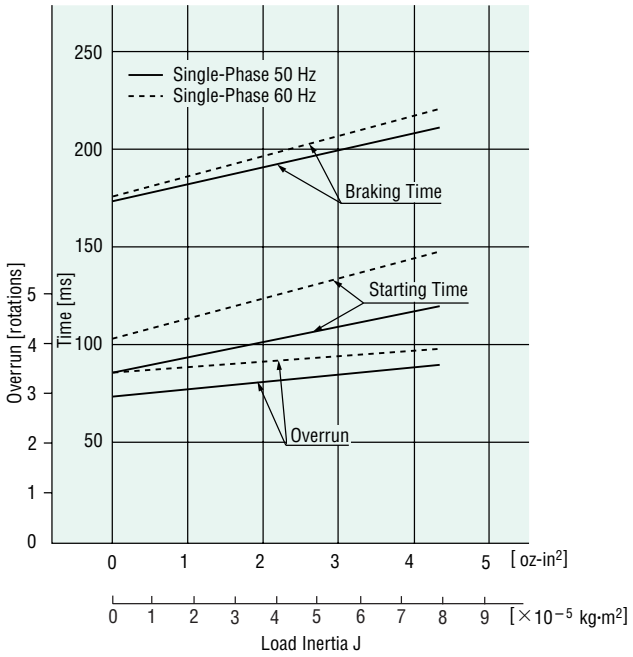
Motor (Round shaft motor)→Page A-11
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

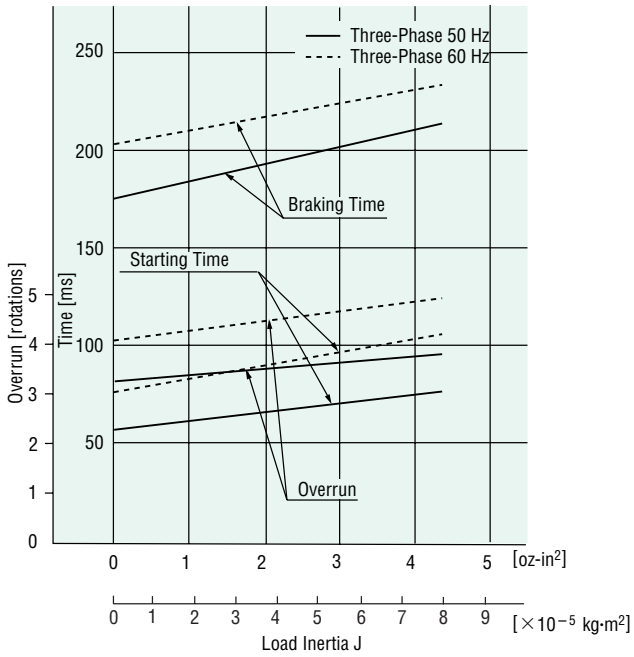
→Page A-12

Starting and Braking Characteristics Common to 40W Type (Reference Values)

Single-Phase Motor



Three-Phase Motor



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

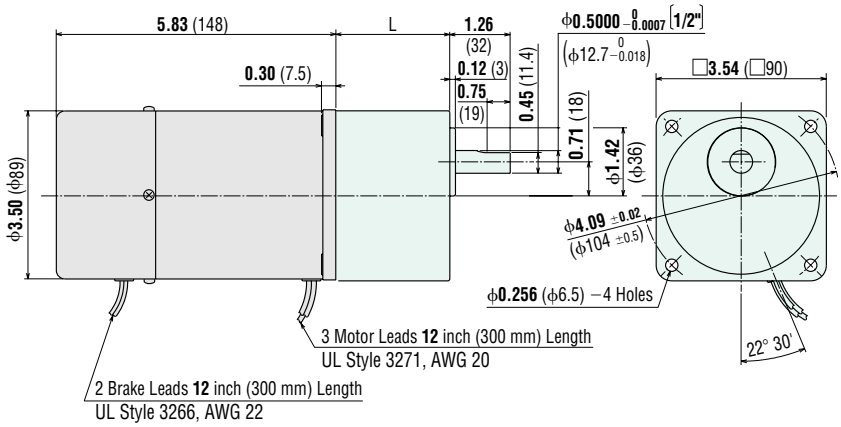
Mounting screws are included with gearheads. Dimensions for screws→A-223

World K Series

Motor
5RK40GN-AWMU
5RK40GN-CWME
5IK40GN-SWM
Weight: 6.4 lb. (2.9 kg)

Gearhead
5GN□KA
Weight: 3.3 lb. (1.5 kg)

DXF A089AU (**5GN3KA**~**18KA**)
A089BU (**5GN25KA**~**180KA**)

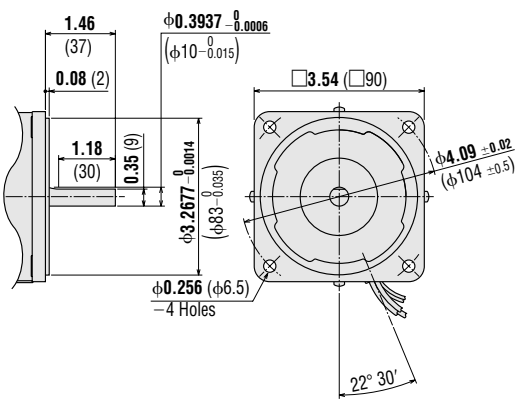


5GN3KA~**18KA**: L = **1.65** (42)
5GN25KA~**180KA**: L = **2.36** (60)

Round Shaft Type
5RK40A-AWMU
5RK40A-CWME
5IK40A-SWM
Weight: 6.4 lb. (2.9 kg)

3/8 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.

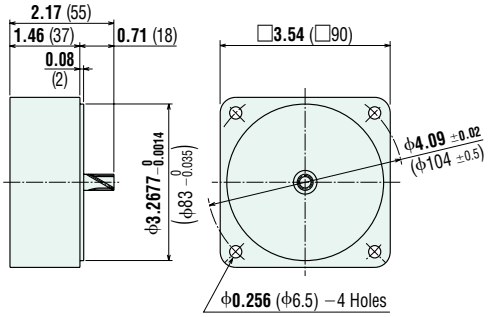
DXF A349



Decimal Gearhead (for World K Series)

5GN10XK Weight: 1.3 lb. (0.6 kg)

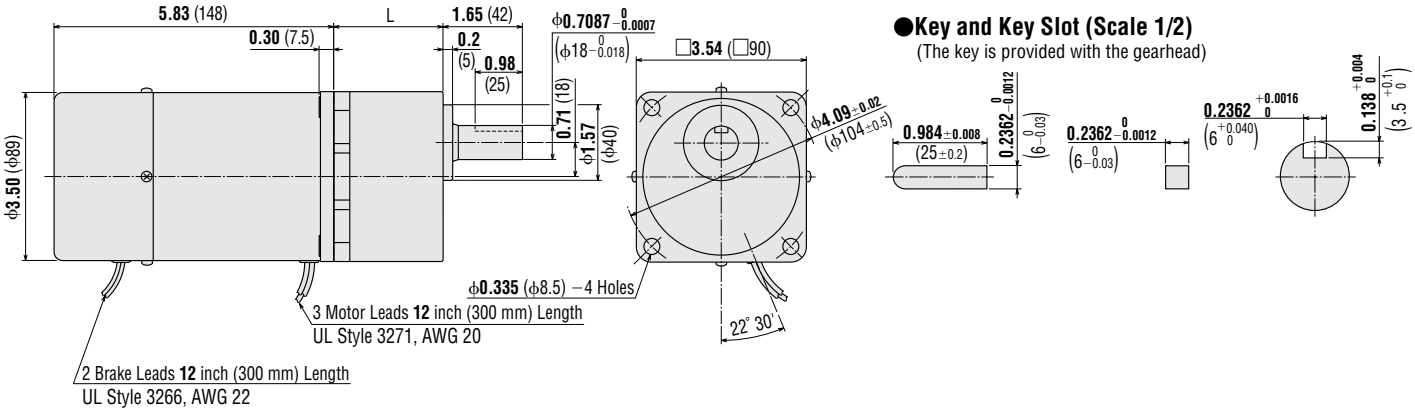
DXF A022



V Series

VHR540AM-□U, **VHR540CM-□E**, **VHI540SM-□** (Combination Type)
Weight: 9.7 lb. (4.4 kg) including gearhead
Motor Model: VHR540AM-GVH, VHR540CM-GVH, VHI540SM-GVH
Gearhead Model: GVH5G□

DXF A215A (GVH5G5~18)
A215B (GVH5G30~90)
A215C (GVH5G120~300)

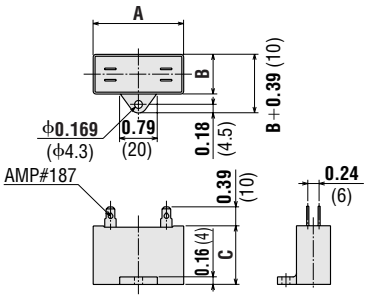


●Key and Key Slot (Scale 1/2)

(The key is provided with the gearhead)

GVH5G5~GVH5G18: L = **1.77** (45)
GVH5G30~GVH5G90: L = **2.28** (58)
GVH5G120~GVH5G300: L = **2.52** (64)

Capacitor (included with single-phase motors)



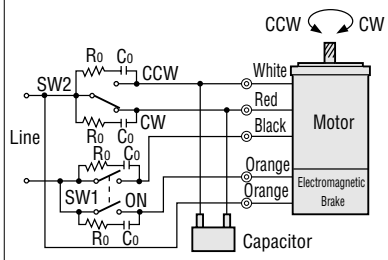
Motor Model	Capacitor Model	Dimension inch (mm) A	B	C	Weight oz. (g)
5RK40GN-AWMU **5RK40A-AWMU** **VHR540AM-□U**	CH120CFAUL	2.28 (58)	0.83 (21)	1.22 (31)	1.8 (50)
5RK40GN-CWME **5RK40A-CWME** **VHR540CM-□E**	CH35BFAUL	2.28 (58)	0.87 (22)	1.38 (35)	1.9 (55)

- 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 Diagrams

Single-Phase Motor

5RK40GN-AWMU
5RK40GN-CWME
VHR540AM-□U
VHR540CM-□E



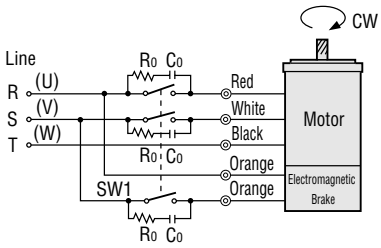
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 5 A minimum (Inductive Load)	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—

Three-Phase Motor

5IK40GN-SWM
VHI540SM-□



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

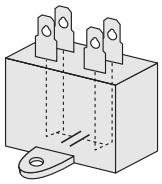
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

Switch No.	Specifications	Note
SW1	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR540AM-□U	VHR540AM-GVH	GVH5G□
VHR540CM-□E	VHR540CM-GVH	
VHI540SM-□	VHI540SM-GVH	

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

Power Off Activated Type Electromagnetic Brake Motors

60 W (1/12 HP)

Frame Size: □ 3.54 in. (□ 90 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
TP **5RK60GU-AWMU**	**5RK60A-AWMU**	1/12	60	Single-Phase 110 Single-Phase 115	60	1.24	53	380	57	405	1450	20
TP **5RK60GU-CWME**	**5RK60A-CWME**			Single-Phase 220	60	0.67	53	380	57	405	1450	5
				Single-Phase 230	50	0.61	66	470	69	490	1200	
				Single-Phase 230	60	0.67	53	380	57	405	1450	
TP **5IK60GU-SWM**	**5IK60A-SWM**			Three-Phase 200	50	0.50	85	600	63	450	1300	—
				Three-Phase 200	60	0.43	71	500	53	380	1550	
				Three-Phase 220	60	0.45	71	500	53	380	1600	
				Three-Phase 230	60	0.46	71	500	53	380	1600	

TP Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
TP **VHR560AM-□U**	1/12	60	Single-Phase 110 Single-Phase 115	60	1.24	53	380	57	405	1450	20
TP **VHR560CM-□E**			Single-Phase 220	60	0.67	53	380	57	405	1450	5
			Single-Phase 230	50	0.61	66	470	69	490	1200	
			Single-Phase 230	60	0.67	53	380	57	405	1450	
TP **VHI560SM-□**			Three-Phase 200	50	0.50	85	600	63	450	1300	—
			Three-Phase 200	60	0.43	71	500	53	380	1550	
			Three-Phase 220	60	0.45	71	500	53	380	1600	
			Three-Phase 230	60	0.46	71	500	53	380	1600	

TP Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
5RK60GU-AWMU **5RK60A-AWMU**	Single-Phase 110 Single-Phase 115	60	0.13	10	71	500
5RK60GU-CWME **5RK60A-CWME**	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.07	10	71	500
5IK60GU-SWM **5IK60A-SWM**	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 60 60	0.07	10	71	500

◆ V Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
VHR560AM-□U	Single-Phase 110 Single-Phase 115	60	0.13	10	71	500
VHR560CM-□E	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.07	10	71	500
VHI560SM-□	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 60 60	0.07	10	71	500

- The values in the table are for the motor only.

Gearheads for World K Series (Sold Separately)

Parallel Shaft

Gearhead Model	Gear Ratio
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	**5GU□RH**	**3.6～180**
Solid Shaft	**5GU□RAA**	**3～180**

- Enter the gear ratio in the box (□) within the model name.
- **Right-Angle Gearheads**→Page A-189

Gearmotor — Torque Table

World K Series (General Purpose)

The maximum permissible torque with a decimal gearhead with a gear ratio of 10:1 is 177 lb-in (20 N·m).

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model \ Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
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**
5RK60GU-AWMU **5RK60GU-CWME** / **5GU□KA**	8.6 0.98	10.6 1.2	14.1 1.6	17.7 2.0	22 2.5	26 3.0	32 3.7	38 4.4	46 5.3	59 6.7	70 8.0	84 9.6	118 13.4	141 16	158 17.9	177 20	177 20	177 20	177 20	177 20
5IK60GU-SWM / **5GU□KA**	8.1 0.92	9.7 1.1	13.2 1.5	15.9 1.8	20 2.3	24 2.8	30 3.5	37 4.2	44 5	55 6.3	66 7.5	79 9.0	110 12.5	132 15	148 16.8	177 20	177 20	177 20	177 20	177 20

Single-Phase 230 VAC 50 Hz

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

Model \ Speed r/min	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
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**
5RK60GU-CWME / **5GU□KA**	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

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model \ Speed r/min	360	300	200	120	100	60	50	30	20	15	10	6
Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**
VHR560AM-□U **VHR560CM-□E**	15.9 1.8	19.4 2.2	29 3.3	48 5.5	58 6.6	92 10.4	110 12.5	184 20.9	260 30	260 30	260 30	260 30
VHI560SM-□	15 1.7	18.5 2.1	27 3.1	45 5.1	54 6.2	86 9.8	104 11.8	173 19.6	260 29.4	260 30	260 30	260 30

Single-Phase 230 VAC 50 Hz

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

Model \ Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3	5
Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**	**300**
VHR560CM-□E	19.4 2.2	23 2.6	35 4	58 6.6	69 7.9	111 12.6	134 15.2	220 25.3	260 30	260 30	260 30	260 30

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2～20% less than the displayed value, depending on the size of the load.

Gearmotor — Torque Table when Right-Angle Gearhead is Attached

Right-Angle Gearheads are available for the World **K** Series only.

→Page A-196

Permissible Overhung Load and Permissible Thrust Load

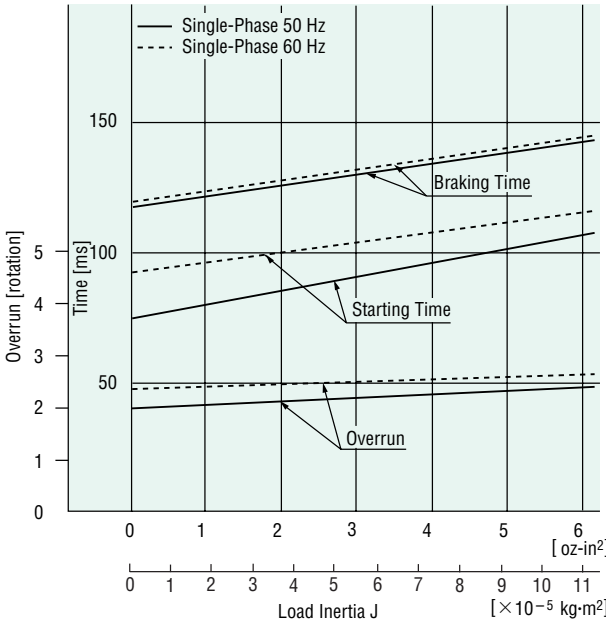
Motor (Round shaft motor)→Page A-11
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

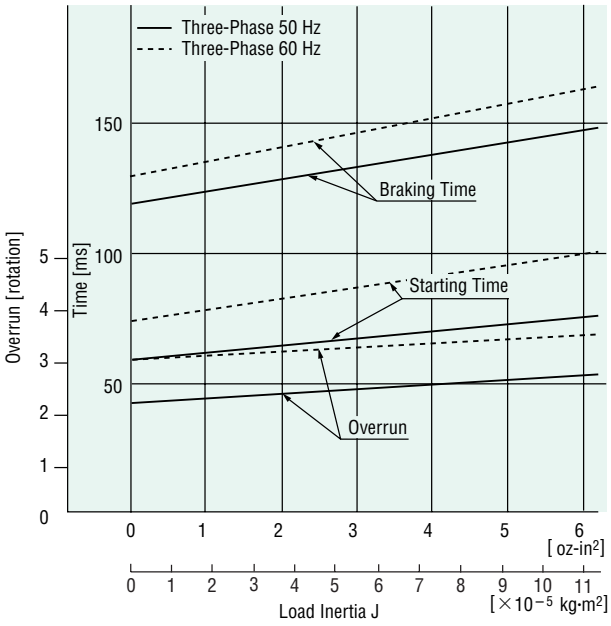
→Page A-12

Starting and Braking Characteristics Common to 60W Type (Reference Values)

Single-Phase Motor



Three-Phase Motor



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

Mounting screws are included with gearheads. Dimensions for screws→A-223

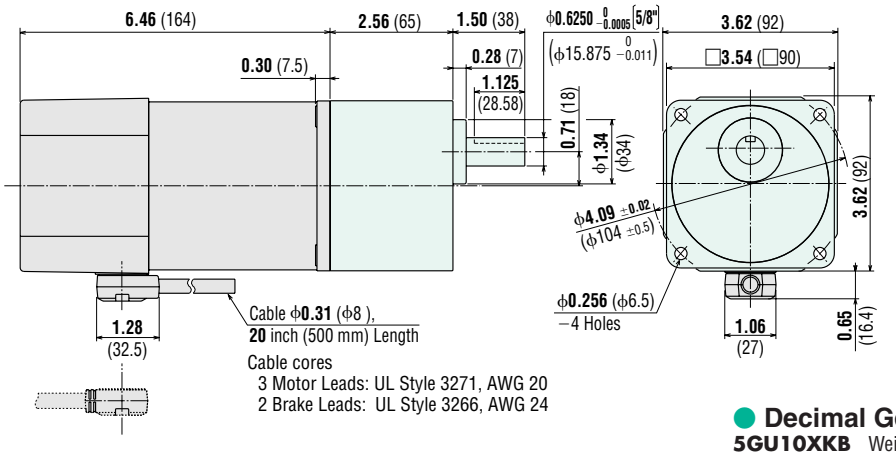
World K Series

Lead Wire Type

Motor
5RK60GU-AWMU
5RK60GU-CWME
5IK60GU-SWM
Weight: 7.5 lb. (3.4 kg)

Gearhead
5GU□KA
Weight: 3.3 lb. (1.5 kg)

DXF A090U (**5GU3KA**～**180KA**)

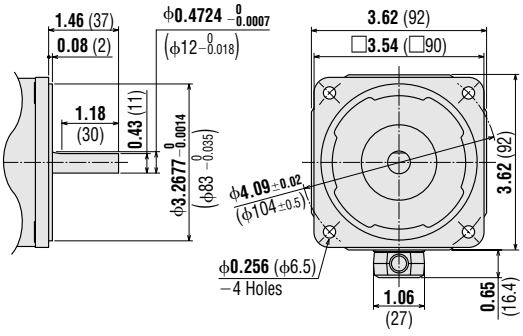


Cable direction can be switched to the opposite direction.

Round Shaft Type

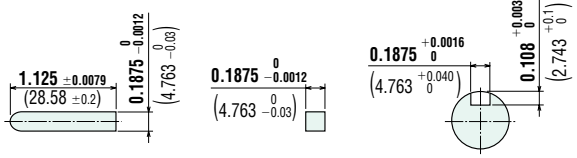
5RK60A-AWMU
5RK60A-CWME
5IK60A-SWM
Weight: 7.5 lb. (3.4 kg)

DXF A350



Key and Key Slot (Scale 1/2)

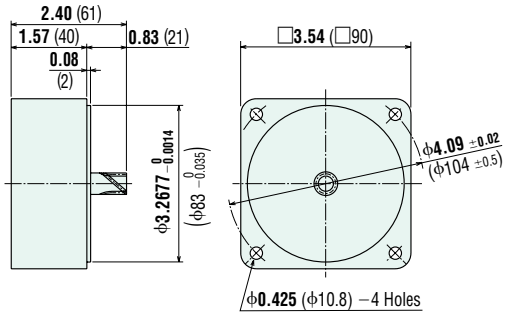
(The key is included with the gearhead)



Decimal Gearhead (for World K Series)

5GU10XKB Weight: 1.3 lb. (0.6 kg)

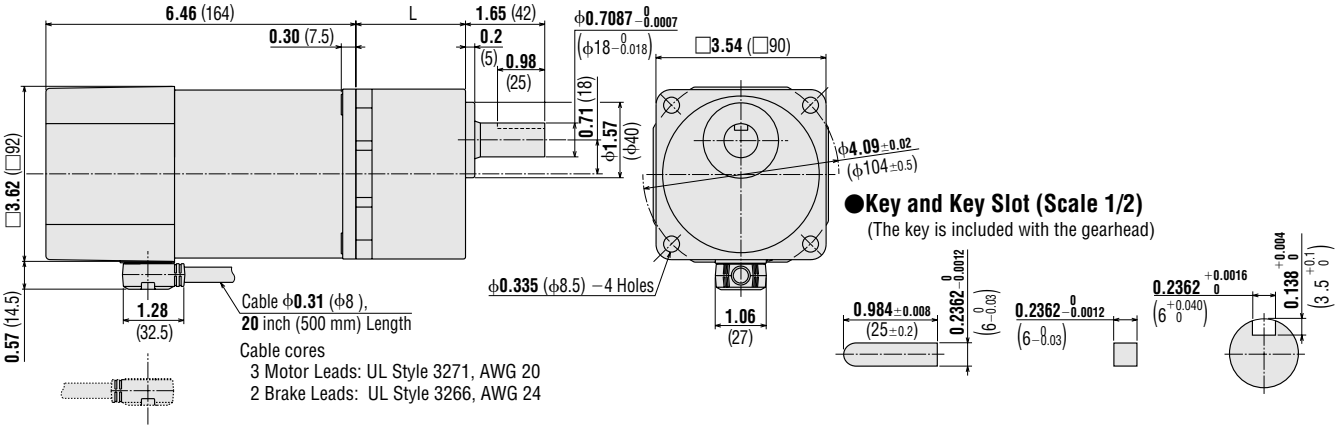
DXF A029



● V Series

VHR560AM-□U, **VHR560CM-□E**, **VHI560SM-□** (Combination Type)
Weight: 11 lb. (4.9 kg) including gearhead
Motor Model: VHR560AM-GVH, VHR560CM-GVH, VHI560SM-GVH
Gearhead Model: GVH5G□

DXF A246A (GVH5G5~18)
A246B (GVH5G30~90)
A246C (GVH5G120~300)

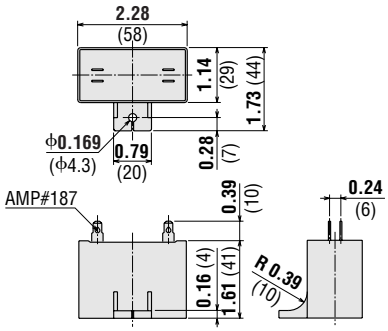


●Key and Key Slot (Scale 1/2)
(The key is included with the gearhead)

Cable direction can be switched to the opposite direction.

GVH5G5~GVH5G18: L = **1.77** (45)
GVH5G30~GVH5G90: L = **2.28** (58)
GVH5G120~GVH5G300: L = **2.52** (64)

● Capacitor (included with single-phase motors)



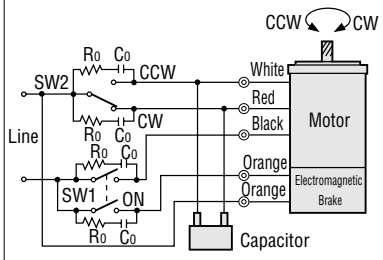
Motor Model	Capacitor Model	Weight oz. (g)
5RK60GU-AWMU **5RK60A-AWMU** **VHR560AM-□U**	CH200CFAUL	3.4 (95)
5RK60GU-CWME **5RK60A-CWME** **VHR560CM-□E**	CH50BFAUL	3.0 (85)

- 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.

Connection Diagrams

Single-Phase Motor

5RK60GU-AWMU
5RK60GU-CWME
VHR560AM-□U
VHR560CM-□U



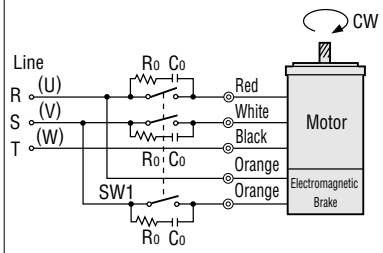
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 5 A minimum (Inductive Load)	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—

Three-Phase Motor

5IK60GU-SWM
VHI560SM-□



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

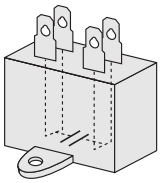
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

Switch No.	Specifications	Note
SW1	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR560AM-□U	VHR560AM-GVH	GVH5G□
VHR560CM-□E	VHR560CM-GVH	
VHI560SM-□	VHI560SM-GVH	

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

Power Off Activated Type Electromagnetic Brake Motors

90 W (1/8 HP)

Frame Size: □ 3.54 in. (□ 90 mm)

World **K** Series
(Gearhead Sold Separately)

V Series / Combination Type
(Pre-assembled Gearmotor)

■ Specifications

● Motor Specifications

◆ World K Series (General Purpose)

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Pinion Shaft Type	Round Shaft Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **5RK90GU-AWMU**	**5RK90A-AWMU**	1/8	90	Single-Phase 110 Single-Phase 115	60	1.81	83	590	83	585	1500	30
(TP) **5RK90GU-CWME**	**5RK90A-CWME**			Single-Phase 220	60	0.96	83	590	85	605	1450	7
				Single-Phase 230	50	0.82	85	600	103	730	1200	
				Single-Phase 230	60	0.96	83	590	85	605	1450	
(TP) **5IK90GU-SWM**	**5IK90A-SWM**			Three-Phase 200	50	0.64	120	850	96	680	1300	—
				Three-Phase 200	60	0.59	99	700	80	570	1550	
				Three-Phase 220	60	0.60	99	700	80	570	1600	
				Three-Phase 230	60	0.61	99	700	80	570	1600	

(TP) Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-11
- **Details of Safety Standards**→Page G-2

◆ V Series (Quiet Operation, High Strength, Long Life)

Model	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
(TP) **VHR590AM-□U**	1/8	90	Single-Phase 110 Single-Phase 115	60	1.81	83	590	83	585	1500	30
(TP) **VHR590CM-□E**			Single-Phase 220	60	0.96	83	590	85	605	1450	7
			Single-Phase 220	50	0.82	85	600	103	730	1200	
			Single-Phase 230	60	0.96	83	590	85	605	1450	
(TP) **VHI590SM-□**			Three-Phase 200	50	0.64	120	850	96	680	1300	—
			Three-Phase 200	60	0.59	99	700	80	570	1550	
			Three-Phase 220	60	0.60	99	700	80	570	1600	
			Three-Phase 230	60	0.61	99	700	80	570	1600	

(TP) Contains 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.

- This type of motor does not contain a built-in simple brake mechanism.
- The "**U**" and "**E**" at the end of the model name indicate that the unit includes a capacitor. These two letters are not listed on the motor nameplate. When the motor is approved under various safety standards, the model name on the nameplate is the approved model name.→Page G-12
- **Details of Safety Standards**→Page G-2
- Models above are provided as combination type with motor and gearhead pre-assembled.
- Enter the gear ratio in the box (□) within the model name.
- The values in the table are for the motor only.

● Electromagnetic Brake (Power Off Activated Type) Specifications

◆ World K Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
5RK90GU-AWMU **5RK90A-AWMU**	Single-Phase 110 Single-Phase 115	60	0.13	10	71	500
5RK90GU-CWME **5RK90A-CWME**	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.07	10	71	500
5IK90GU-SWM **5IK90A-SWM**	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 60 60	0.07	10	71	500

◆ V Series

Model	Voltage VAC	Frequency Hz	Current A	Input W	Holding Brake Torque oz-in	Holding Brake Torque mN·m
VHR590AM-□U	Single-Phase 110 Single-Phase 115	60	0.13	10	71	500
VHR590CM-□E	Single-Phase 220 Single-Phase 230 Single-Phase 230	60 50 60	0.07	10	71	500
VHI590SM-□	Single-Phase 200 Single-Phase 200 Single-Phase 220 Single-Phase 230	50 60 60 60	0.07	10	71	500

- The values in the table are for the motor only.

Dimensions A-160 | Connection Diagrams A-162 | List of Motor and Gearhead Combinations for **V** Series A-162

Gearheads for World K Series (Sold Separately)

Parallel Shaft

Gearhead Model	Gear Ratio
5GU□KA	**3~180**
5GU□KHA (High Power Type)	**50~180**
5GU10XKB (Decimal Gearhead) [for **5GU□KA**]	
5GU10XK (Decimal Gearhead) [for **5GU□KHA**]	

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

Right-Angle

Type	Gearhead Model	Gear Ratio
Hollow Shaft	**5GU□RH**	**3.6~180**
Solid Shaft	**5GU□RAA**	**3~180**

- Enter the gear ratio in the box (□) within the model name.
- **Right-Angle Gearheads**→Page A-189

Gearmotor — Torque Table

World K Series (General Purpose)

The maximum permissible torque when a decimal gearhead with a gear ratio of 10:1 is attached are as follows:
5GU□KA: 177lb-in (20N·m)
5GU□KHA: 260lb-in (30N·m)

Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
	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**
5RK90GU-AWMU	**5GU□KA**	12.3 1.4	15 1.7	21 2.4	24 2.8	31 3.6	38 4.3	46 5.3	56 6.4	68 7.7	85 9.7	102 11.6	123 13.9	170 19.3	177 20	177 20	177 20	177 20	177 20	177 20	177 20
	5GU□KHA	—	—	—	—	—	—	—	—	—	—	—	—	170 19.3	200 23.2	220 25.9	260 30	260 30	260 30	260 30	260 30
5RK90GU-CWME	**5GU□KA**	13.2 1.5	15.9 1.8	22 2.5	25 2.9	32 3.7	38 4.4	48 5.5	58 6.6	69 7.9	88 10.0	106 12.0	127 14.4	177 20	177 20	177 20	177 20	177 20	177 20	177 20	177 20
	5GU□KHA	—	—	—	—	—	—	—	—	—	—	—	—	177 20	210 24	230 26.8	260 30	260 30	260 30	260 30	260 30
5IK90GU-SWM	**5GU□KA**	12.3 1.4	15 1.7	20 2.3	24 2.8	30 3.5	37 4.2	46 5.2	54 6.2	66 7.5	83 9.4	100 11.3	119 13.5	166 18.8	177 20	177 20	177 20	177 20	177 20	177 20	177 20
	5GU□KHA	—	—	—	—	—	—	—	—	—	—	—	—	166 18.8	200 22.6	220 25.2	260 30	260 30	260 30	260 30	260 30

- **KA** type is standard gearhead. **KHA** type is high-powerd gearhead.

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
	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**
5RK90GU-CWME	**5GU□KA**	15.9 1.8	18.5 2.1	26 3	30 3.5	38 4.4	46 5.3	59 6.7	70 8.0	84 9.6	106 12.0	128 14.5	153 17.3	177 20	177 20	177 20	177 20	177 20	177 20	177 20	177 20
	5GU□KHA	—	—	—	—	—	—	—	—	—	—	—	—	210 24.1	250 28.9	260 30	260 30	260 30	260 30	260 30	260 30

- **KA** type is standard gearhead. **KHA** type is high-powerd gearhead.

V Series (Quiet Operation, High Strength, Long Life)

Single-Phase 115 VAC/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	360	300	200	120	100	60	50	30	20	15	10
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
VHR590AM-□U		23 2.6	28 3.2	41 4.7	69 7.9	80 9.1	133 15.1	160 18.1	260 30.2	350 40	350 40	350 40
VHR590CM-□E		23 2.7	29 3.3	43 4.9	72 8.2	83 9.4	138 15.6	165 18.7	270 31.2	350 40	350 40	350 40
VHI590SM-□		23 2.6	27 3.1	40 4.6	68 7.7	77 8.8	130 14.7	155 17.6	260 29.4	350 40	350 40	350 40

Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	300	250	166	100	83	50	41	25	16	12.5	8.3
	Gear Ratio	**5**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
VHR590CM-□E		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

- Gearheads and decimal gearheads are sold separately. Decimal gearheads are 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 speed is calculated by dividing the motor's synchronous speed (50 Hz: 1500 r/min, 60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2~20% less than the displayed value, depending on the size of the load.

Gearmotor — Torque Table when Right-Angle Gearhead is Attached

Right-Angle Gearheads are available for the World **K** Series only.

→Page A-196

Permissible Overhung Load and Permissible Thrust Load

Motor (Round shaft motor)→Page A-11

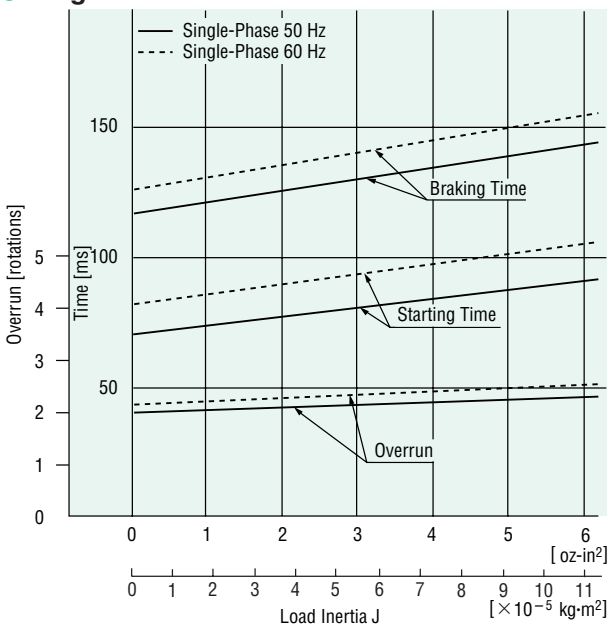
Gearhead→Page A-11

Permissible Load Inertia J for Gearhead

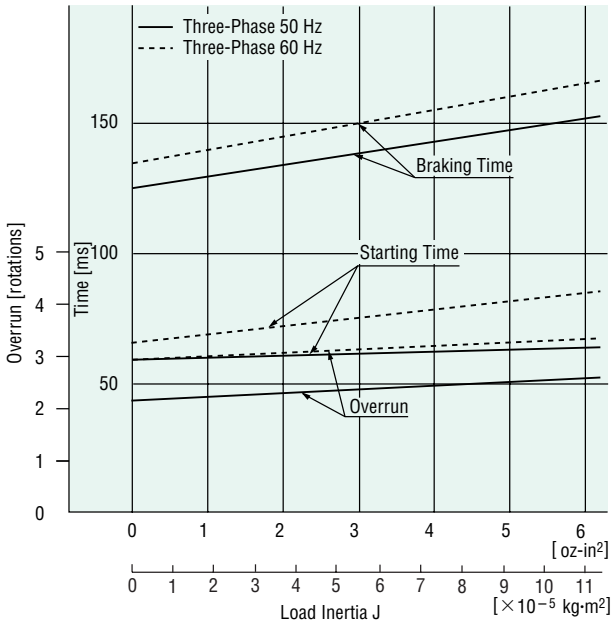
→Page A-12

Starting and Braking Characteristics Common to 90W Type (Reference Values)

Single-Phase Motor



Three-Phase Motor



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

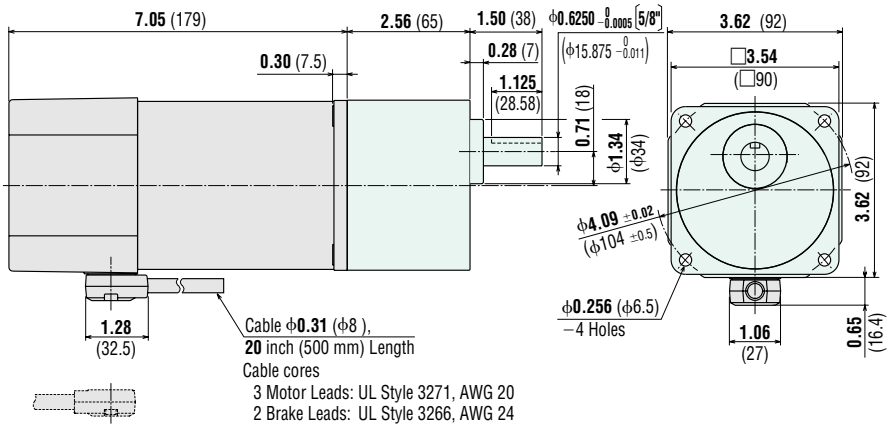
Mounting screws are included with gearheads. Dimensions for screws→A-223

World K Series

Motor
5RK90GU-AWMU
5RK90GU-CWME
5IK90GU-SWM
Weight: 8.6 lb. (3.9 kg)

Gearhead
5GU□KA
Weight: 3.3 lb. (1.5 kg)

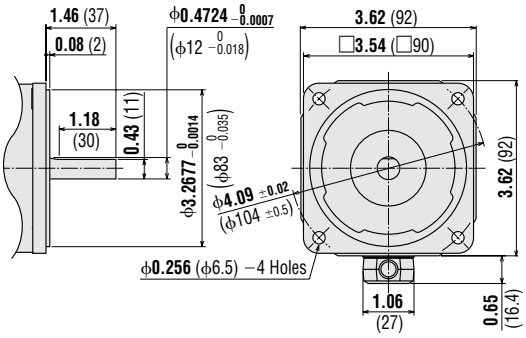
DXF A091U (**5GU3KA**~**180KA**)



Cable direction can be switched to the opposite direction.

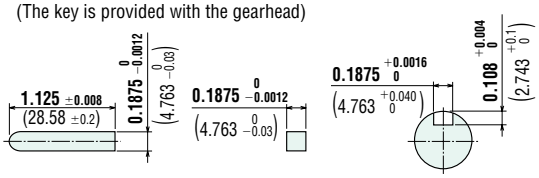
Round Shaft Type
5RK90A-AWMU
5RK90A-CWME
5IK90A-SWM
Weight: 8.6 lb. (3.9 kg)

DXF A351



●Key and Key Slot (Scale 1/2)

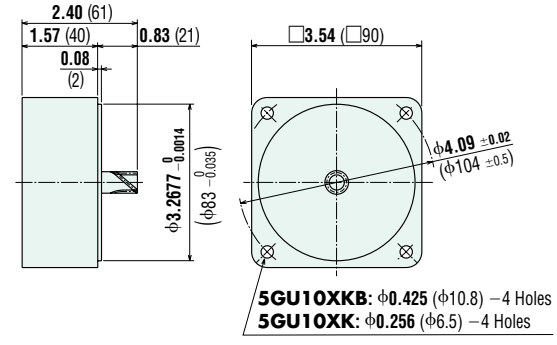
(The key is provided with the gearhead)



Decimal Gearheads (for World K Series)

5GU10XKB (for **5GU□KA**)
5GU10XK (for **5GU□KHA**)
Weight: 1.3 lb. (0.6 kg)

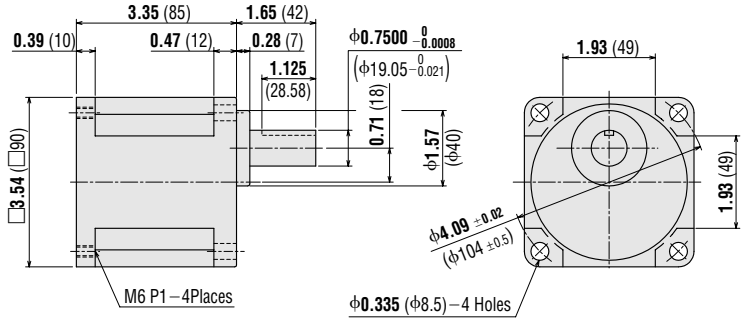
DXF A029



High-Power Type Gearhead (for World K Series)

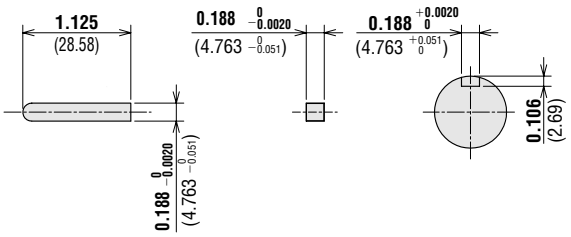
5GU□KHA Weight: 4.2 lb. (1.9 kg)

DXF A038U



●Key and Key Slot (Scale 1/2)

(The key is provided with the gearhead)

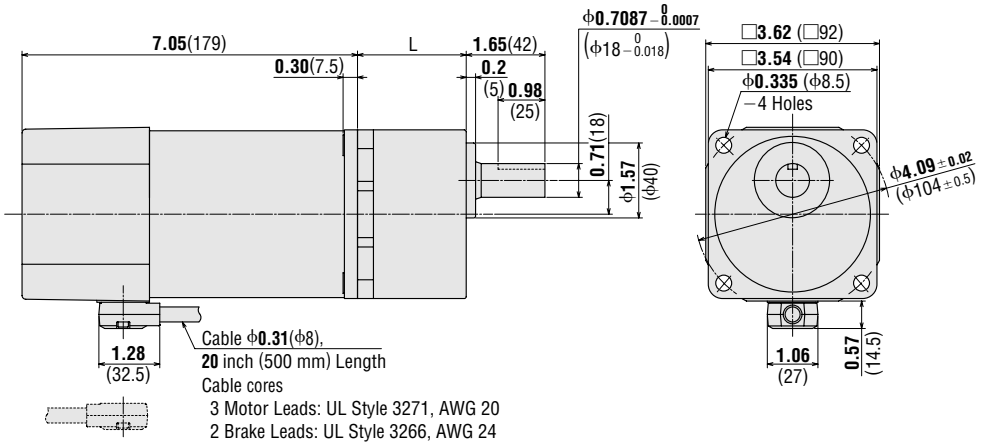


● V Series

◆ Lead Wire Type

VHR590AM-□U, **VHR590CM-□E**, **VHI590SM-□** (Combination Type)
Weight: 12 lb. (5.4 kg) including gearhead
Motor Model: VHR590AM-GVR, VHR590CM-GVR, VHI590SM-GVR
Gearhead Model: GVR5G□

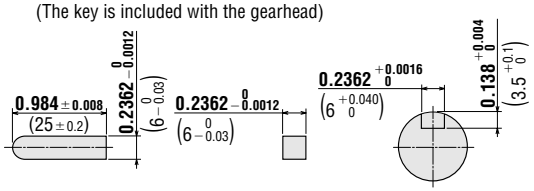
DXF A399A (GVR5G5~15)
A399B (GVR5G18~36)
A399C (GVR5G60~180)



Cable direction can be switched to the opposite direction.

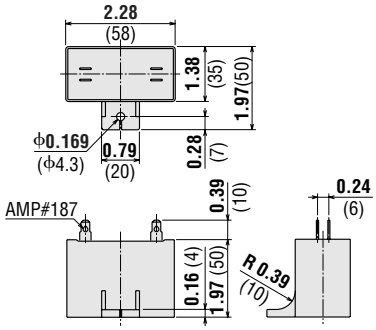
●Key and Key Slot (Scale 1/2)

(The key is included with the gearhead)



GVR5G5~GVR5G15: L = **1.77** (45)
GVR5G18~GVR5G36: L = **2.28** (58)
GVR5G60~GVR5G180: L = **2.76** (70)

● Capacitor (included with single-phase motors)



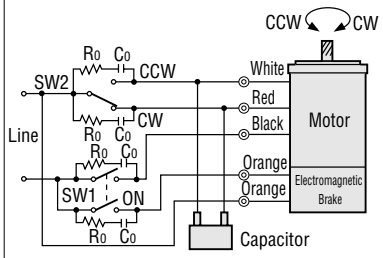
Motor Model	Capacitor Model	Weight oz. (g)
5RK90GU-AWMU **5RK90A-AWMU** **VHR590AM-□U**	CH300CFAUL	4.9 (140)
5RK90GU-CWME **5RK90A-CWME** **VHR590CM-□E**	CH70BFAUL	4.6 (130)

- 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 Diagrams

Single-Phase Motor

5RK90GU-AWMU
5RK90GU-CWME
VHR590AM-□U
VHR590CM-□E



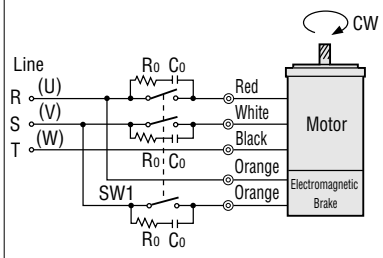
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

Direction of Rotation
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

Switch No.	Specifications		Note
	Single-Phase 110 VAC Input Single-Phase 115 VAC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	
SW1	125 VAC 5 A minimum (Inductive Load)	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—

Three-Phase Motor

5IK90GU-SWM
VHI590SM-□



SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the motor is stopped, apply voltage between the two brake lead wires (orange).)

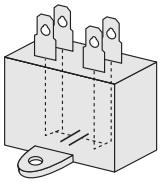
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

Switch No.	Specifications	Note
SW1	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously

- The direction of motor rotation is as viewed from the shaft end of the motor.
- CW represents the clockwise direction, while CCW represents the counterclockwise direction.
- Connection diagrams are also valid for the equivalent round shaft motors.
- Ro and Co indicates surge absorber circuit. [Ro = 5～200Ω, Co = 0.1～0.2μF, 200WV (400WV)]
  EPCR1201-2 is available as an optional surge absorber. →Page A-218
- **How to connect a capacitor**→Page A-225

Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



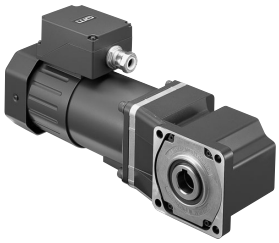
List of Motor and Gearhead Combinations for V Series

Model numbers for motor and gearhead combinations are shown below.

Model	Motor Model	Gearhead Model
VHR590AM-□U	VHR590AM-GVR	GVR5G□
VHR590CM-□E	VHR590CM-GVR	
VHI590SM-□	VHI590SM-GVR	

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

Induction Motors BH Series
Power Off Activated Electromagnetic Brake
200 W (1/4 HP)
Frame Size: □ 4.09 in. (□ 104 mm)



Features

- **BH** Series motors provide 200 W output power and up to 530 lb-in. (60 N·m) of torque in a compact 4.09 in. sq. (120mm sq.) mounting configuration.
- Electromagnetic brakes provide holding torque of up to 210 oz-in. (1.5 N·m).
- For easy installation, the **BH** Series motor and gearhead come pre-assembled.
- Right-angle gearheads are available in hollow and solid shaft versions.

✻Motors and gearheads are also available separately.

✻The combination type comes with the motor and its dedicated gearhead already pre-assembled. This simplifies installation in equipment. There are various combinations of motors and gearheads available. Motors and gearheads are also available separately so that they can be on hand to make changes or repairs.

Specifications — Continuous Rating

Motor Specifications

Model		Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
Combination Type	Round Shaft	HP	W	VAC	Hz	A	oz-in	N·m	oz-in	N·m	r/min	μF
BHI62FMT-□RH (TP) **BHI62FMT-□RA** **BHI62FMT-□**	**BHI62FMT-A**	1/4	200	Single-Phase 110 Single-Phase 115	60	3	124 139	0.88 0.98	180	1.27	1500	40
BHI62EMT-□RH (TP) **BHI62EMT-□RA** **BHI62EMT-□**	**BHI62EMT-A**			Single-Phase 220	60	1.5	139	0.98	180	1.27	1500	10
				Single-Phase 230	50 60	1.5	139	0.98	210 180	1.52 1.27	1250 1500	10
BHI62SMT-□RH (TP) **BHI62SMT-□RA** **BHI62SMT-□**	**BHI62SMT-A**			Three-Phase 200	50 60	1.1	210 177	1.49 1.25	210 177	1.49 1.25	1250 1500	—
				Three-Phase 220 Three-Phase 230	60 60	0.95	174 167	1.23 1.18	174 167	1.23 1.18	1550 1600	—

(TP) The product contains 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.
- **Details of Safety Standards**→Page G-2

Electromagnetic Brake (Power Off Activated Type) Specifications

Model	Voltage	Frequency	Current	Input	Holding Brake Torque	
	VAC	Hz	A	W	oz-in	N·m
BHI62FMT-□RH **BHI62FMT-□RA** **BHI62FMT-□** **BHI62FMT-A**	Single-Phase 110 Single-Phase 115	60	0.17	12	210	1.5
BHI62EMT-□RH **BHI62EMT-□RA** **BHI62EMT-□** **BHI62EMT-A**	Single-Phase 220	60	0.09	12	210	1.5
	Single-Phase 230	50 60	0.09	12	210	1.5
BHI62SMT-□RH **BHI62SMT-□RA** **BHI62SMT-□** **BHI62SMT-A**	Single-Phase 200	50 60	0.09	12	210	1.5
	Single-Phase 220 Single-Phase 230	60	0.09	12	210	1.5

- The values in the table are the motor only.

Product Line

Combination Type

Right-Angle Shaft

Type	Power Supply Voltage	Model	Gear Ratio
Hollow Shaft	Single-Phase 110/115 VAC	**BHI62FMT-□RH**	**6~180**
	Single-Phase 220/230 VAC	**BHI62EMT-□RH**	**6~180**
	Three-Phase 200/220/230 VAC	**BHI62SMT-□RH**	**6~180**
Solid Shaft	Single-Phase 110/115 VAC	**BHI62FMT-□RA**	**6~180**
	Single-Phase 220/230 VAC	**BHI62EMT-□RA**	**6~180**
	Three-Phase 200/220/230 VAC	**BHI62SMT-□RA**	**6~180**

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

Parallel Shaft

Power Supply Voltage	Model	Gear Ratio
Single-Phase 110/115 VAC	**BHI62FMT-□**	**3.6~180**
Single-Phase 220/230 VAC	**BHI62EMT-□**	**3.6~180**
Three-Phase 200/220/230 VAC	**BHI62SMT-□**	**3.6~180**

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

Round Shaft Type

Power Supply Voltage	Model
Single-Phase 110/115 VAC	**BHI62FMT-A**
Single-Phase 220/230 VAC	**BHI62EMT-A**
Three-Phase 200/220/230 VAC	**BHI62SMT-A**

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

Gearmotor — Torque Table

Right-Angle Shaft Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	300	200	120	100	60	50	30	20	15	10
	Gear Ratio	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
BHI62FMT-□RH, BHI62FMT-□RA **BHI62EMT-□RH, BHI62EMT-□RA**		49 5.6	73 8.3	123 13.9	147 16.7	240 27.8	290 33.4	380 43	450 51.5	530 60	530 60
BHI62SMT-□RH, BHI62SMT-□RA		46 5.2	69 7.8	114 12.9	137 15.5	220 25.8	270 31	380 43	450 51.5	530 60	530 60

Right-Angle Shaft Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	250	167	100	83	50	42	25	17	12.5	8.3
	Gear Ratio	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
BHI62EMT-□RH, BHI62EMT-□RA		59 6.7	88 10	146 16.6	177 20	290 33.3	310 36	380 43	450 51.5	530 60	530 60

Parallel Shaft Single-Phase 115/230 VAC 60 Hz, Three-Phase 230 VAC 60 Hz

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

Model	Speed r/min	500	300	200	120	100	60	50	30	20	15	10
	Gear Ratio	**3.6**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
BHI62FMT-□, BHI62EMT-□		36 4.1	61 6.9	91 10.3	145 16.4	174 19.7	290 32.8	340 39.3	350 40	350 40	350 40	350 40
BHI62SMT-□ (230 VAC)		33 3.8	56 6.4	84 9.6	134 15.2	161 18.3	260 30.4	320 36.5	350 40	350 40	350 40	350 40

Parallel Shaft Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	417	250	167	100	83	50	42	25	17	12.5	8.3
	Gear Ratio	**3.6**	**6**	**9**	**15**	**18**	**30**	**36**	**60**	**90**	**120**	**180**
BHI62EMT-□		43 4.9	72 8.2	108 12.3	173 19.6	200 23.5	340 39.2	350 40	350 40	350 40	350 40	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.
● The speed is calculated by dividing the motor's synchronous speed (60 Hz: 1800 r/min) by the gear ratio. The actual speed is 2~20% less than the displayed value, depending on the size of the load.
● Decimal gearheads are not available for the **BH** Series.

Permissible Overhung Load and Permissible Thrust Load

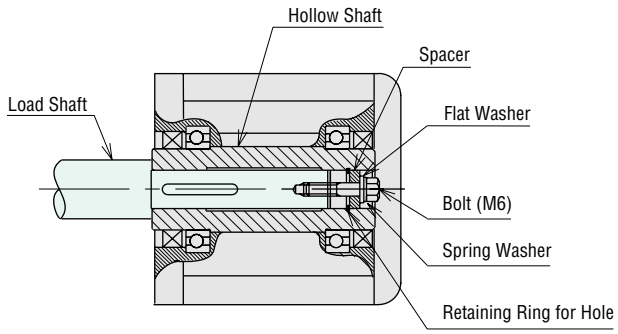
Combination Type →Page A-11
Round Shaft Motor →Page A-11

Permissible Load Inertia J for Gearhead

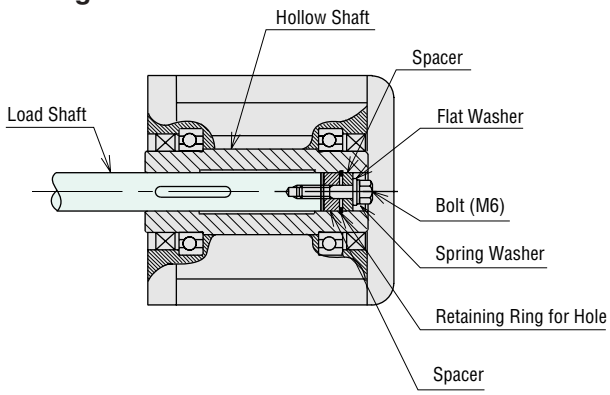
→Page A-12

Mounting Method of Hollow Shaft Gearheads

Stepped-Down Shaft



Straight Load Shaft



These diagrams show how to mount loads depending on the shape of the shaft.

The tolerance of the inner diameter for the hollow shaft is finished as H8, and "key slot" processing is given to mount the load shaft. The recommended tolerance of the load shaft is h7. Apply a coating of molybdenum disulfide or similar grease to the inner diameter of the load shaft to prevent binding. Recommended load shaft dimensions are shown below.

Recommended size of inner diameter for the hollow shaft and load shaft

Unit = **inch** (mm)

Model	**BH6G2-□RH**
Inner diameter of hollow shaft H8	$\phi 0.9843\ ^{+0.0013}_{0}$ $(\phi 25\ ^{+0.033}_{0})$
Recommended load shaft diameter h7	$\phi 0.9843\ ^{0}_{-0.0008}$ $(\phi 25\ ^{0}_{-0.021})$

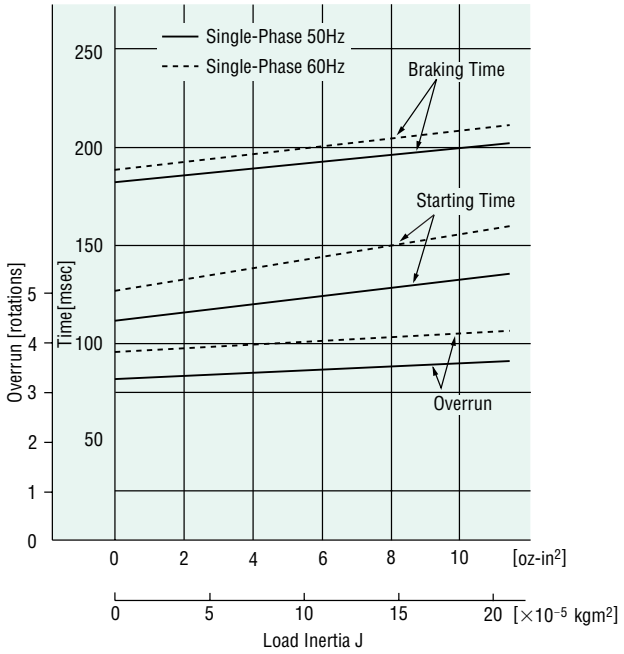
- Replace the safety cover after installing the load shaft.

Note:

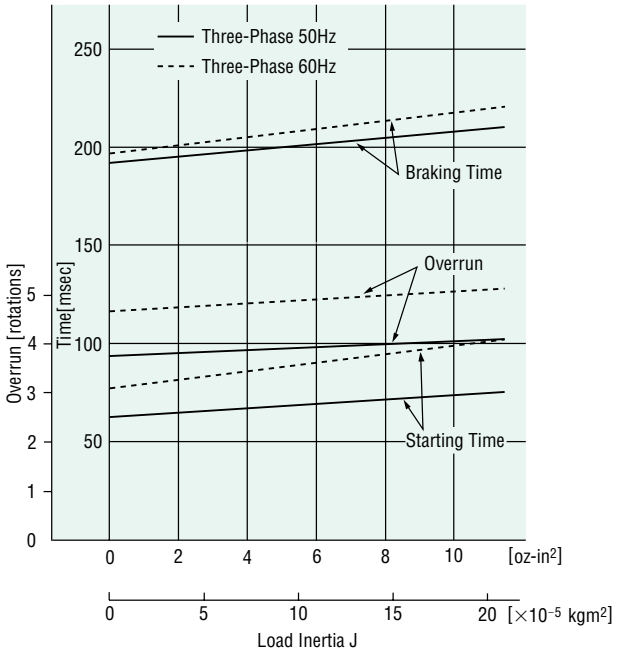
- Be careful not to apply a shock to the hollow shaft when mounting a load. It may damage the bearing inside the gearhead.

Starting and Braking Characteristics (Reference Values)

Single-Phase Motor



Three-Phase Motor



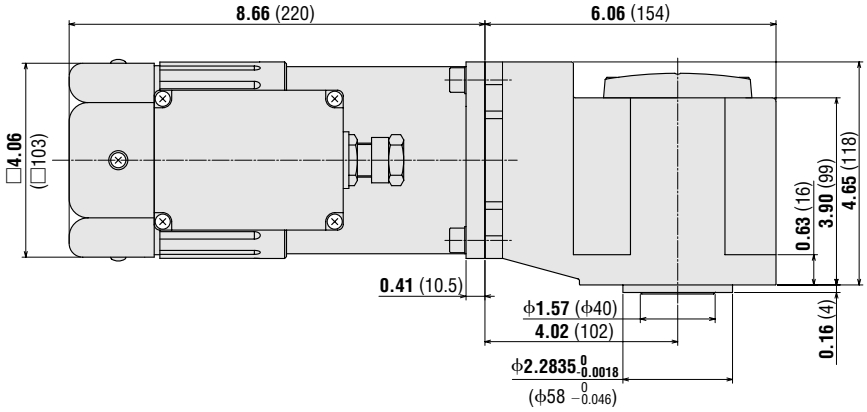
Dimensions Scale 1/4, Unit = **inch** (mm)

Mounting screws are included with gearheads. Dimensions for screws→A-223
Enter the gear ratio in the box (□) within the model name.

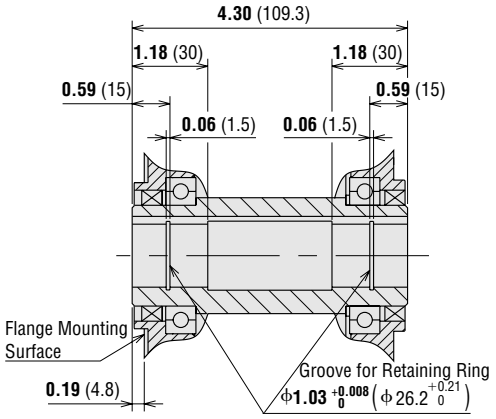
◆ Combination Type Right-Angle Shaft, Hollow Shaft

BHI62FMT-□RH, BHI62EMT-□RH, BHI62SMT-□RH
Weight: 25 lb. (11.5 kg) including gearhead
Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2
Gearhead Model: BH6G2-□RH

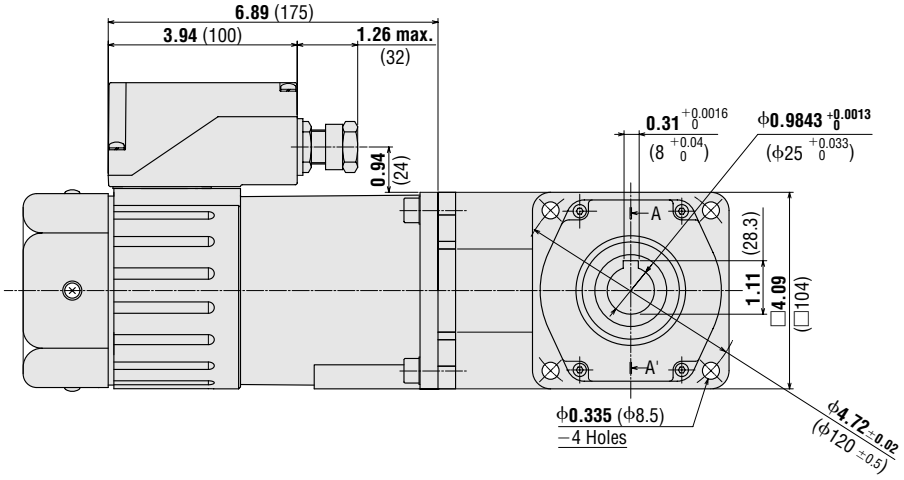
DXF A384

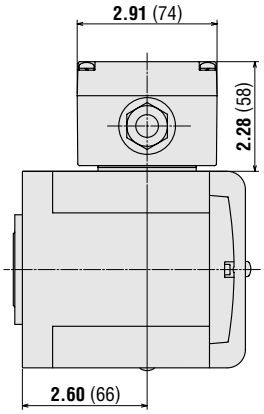


●Use cable (VCTF) with a diameter of ϕ**0.31** inch (ϕ8 mm) ~ϕ**0.47** inch (ϕ12 mm)



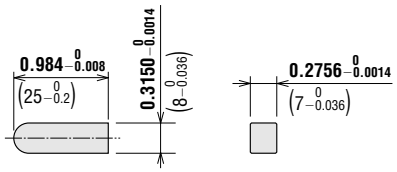
Section AA'
(Detail drawing of output shaft)





●Use cable (VCTF) with a diameter of ϕ**0.31** inch (ϕ8 mm) ~ϕ**0.47** inch (ϕ12 mm)

●Key (Included) (Scale 1/2)

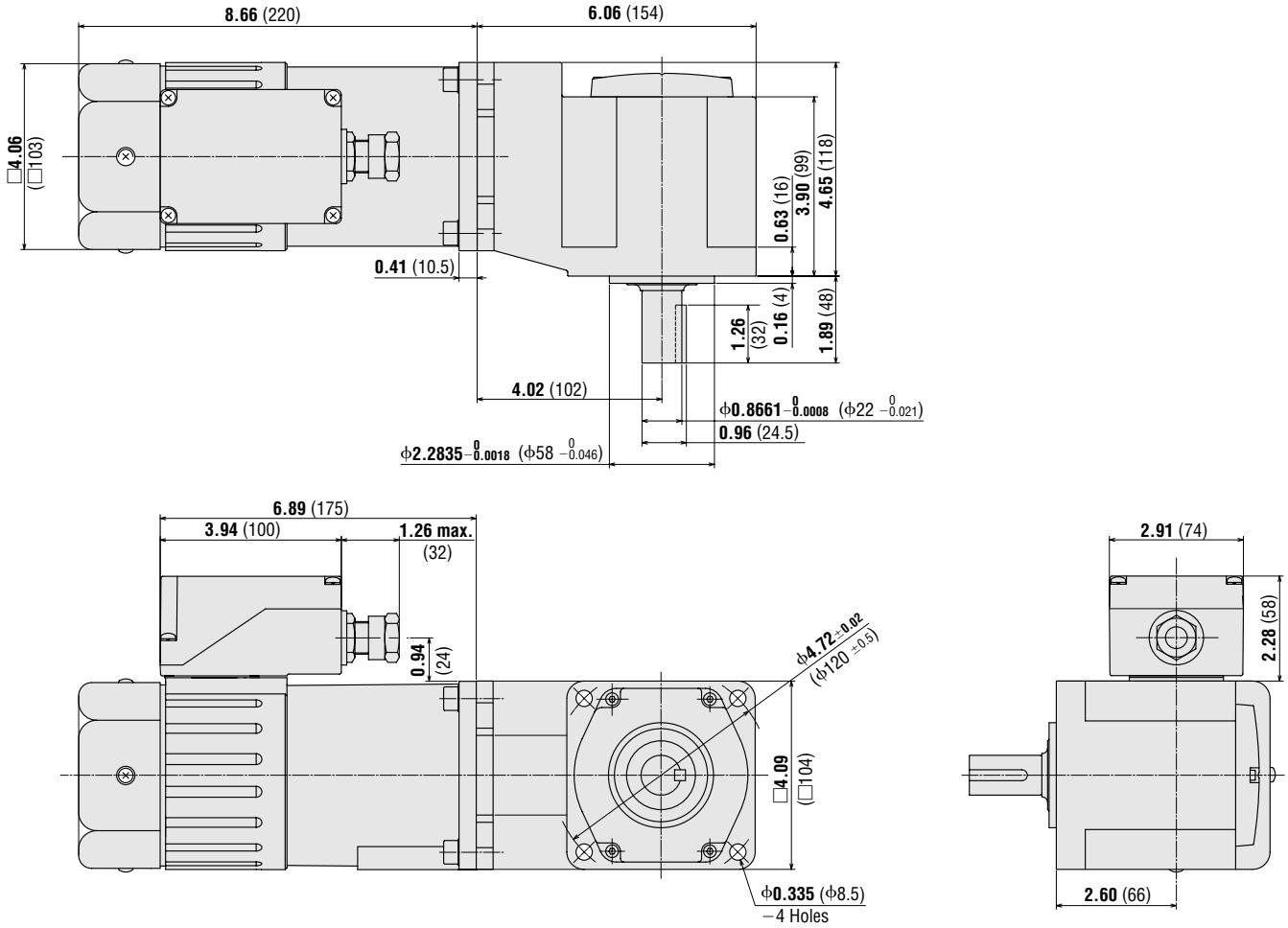


◆ Combination Type Right-Angle Shaft, Solid Shaft

BHI62FMT-□RA, BHI62EMT-□RA, BHI62SMT-□RA

Weight: 25 lb. (11.5 kg) including gearhead
Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2
Gearhead Model: BH6G2-□RA

DXF A385



●Use cable (VCTF) with a diameter of Φ**0.31** inch (Φ8 mm) ~Φ**0.47** inch (Φ12 mm)

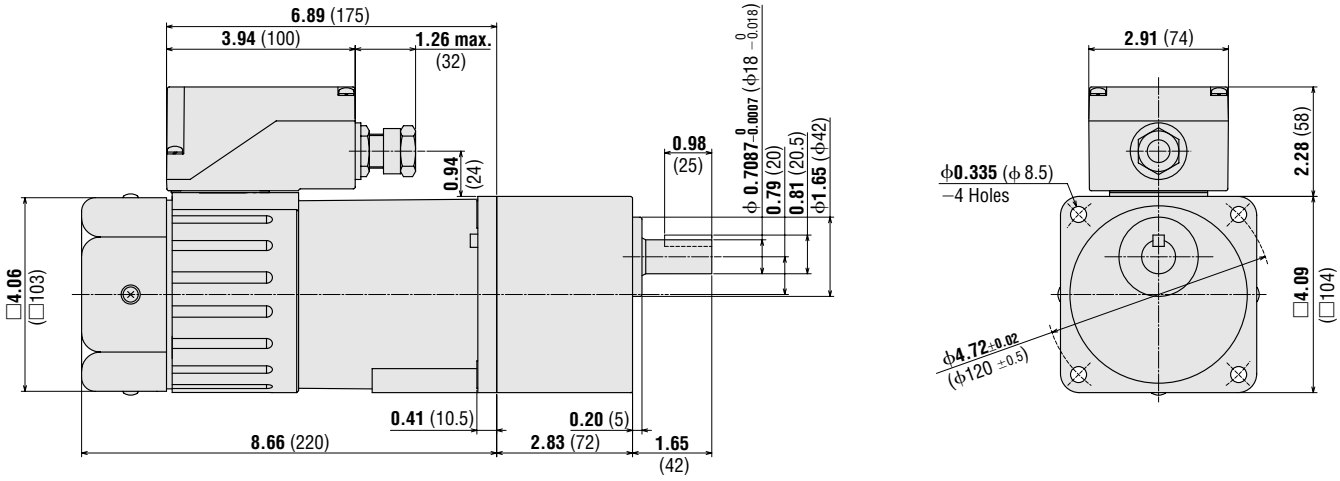
●Key and Key Slot (Included) (Scale 1/2)

At the time of shipment, the parallel key is compressed in the key slot.

◆ Combination Type Parallel Shaft

BHI62FMT-□, BHI62EMT-□, BHI62SMT-□
Weight: 21 lb. (9.5 kg)
Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2
Gearhead Model: BH6G2-□

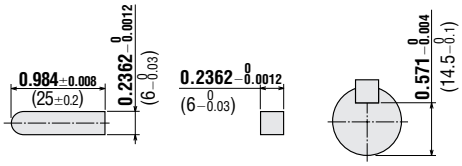
DXF A386



●Use cable (VCTF) with a diameter of ϕ**0.31** inch (ϕ8 mm) ~ϕ**0.47** inch (ϕ12 mm)

●Key and Key Slot (Included) (Scale 1/2)

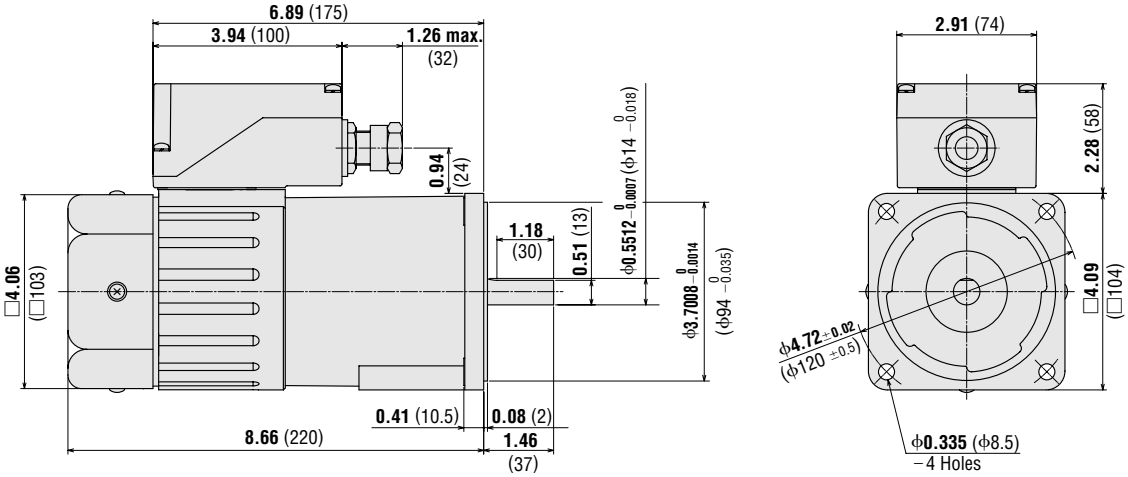
At the time of shipment, the parallel key is compressed in the key slot.



◆ Round Shaft

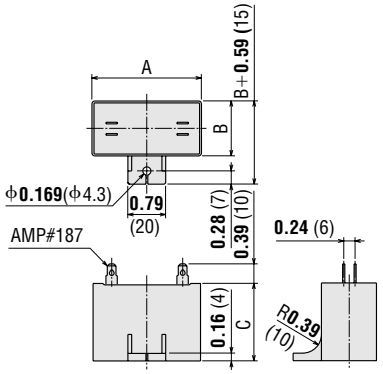
BHI62FMT-A, BHI62EMT-A, BHI62SMT-A
Weight: 14 lb. (6.5 kg)

DXF A387



●Use cable (VCTF) with a diameter of ϕ**0.31** inch (ϕ8 mm) ~ϕ**0.47** inch (ϕ12 mm)

◆ Capacitor (Included with single-phase motors)



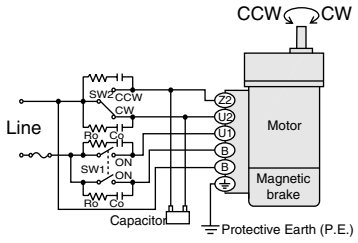
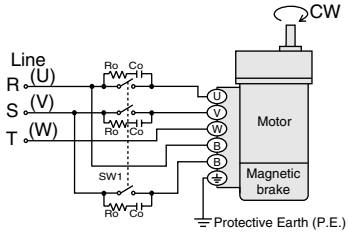
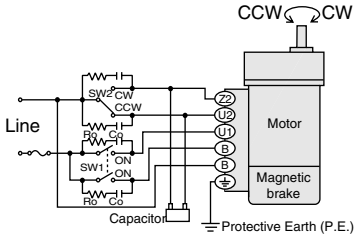
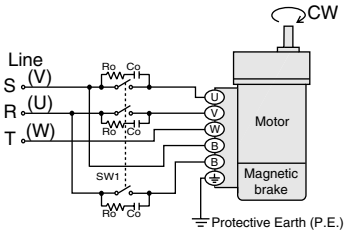
◆ Capacitor Dimensions Unit = **inch** (mm)

Model	Capacitor Model	A	B	C	Weight oz. (g)
BHI62FMT-□RH **BHI62FMT-□RA** **BHI62FMT-□** **BHI62FMT-A**	CH400CFAUL2	2.28 (58)	1.61 (41)	2.28 (58)	6.2 (175)
BHI62EMT-□RH **BHI62EMT-□RA** **BHI62EMT-□** **BHI62EMT-A**	CH100BFAUL	2.28 (58)	1.38 (35)	1.97 (50)	4.7 (132)

● 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 Diagrams

The direction of motor rotation is as viewed from the shaft end of the motor. "CW" indicates clockwise direction, while "CCW" counterclockwise direction.

Motor	Single-Phase Induction Motor	Three-Phase Induction Motor
Parallel Shaft Combination Type **BHI62□MT-3.6~9** **BHI62□MT-60~180** Round Shaft **BHI62□MT-A**		
Parallel Shaft Combination Type **BHI62□MT-15~36** Right-Angle Shaft Combination Type **BHI62□MT-6RH~180RH** **BHI62□MT-6RA~180RA**		
Direction of Rotation	To rotate the motor in a clockwise (CW) direction, flip SW2 to CW. To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.	To rotate the motor in a counterclockwise (CCW) direction, change any two connections between U, V and W.

SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.

Switch No.	Specifications			Note
	Single-Phase 110V AC Input Single-Phase 115V AC Input	Single-Phase 220 VAC Input Single-Phase 230 VAC Input	Three-Phase 200/220/230 VAC Input	
SW1	125 VAC 5 A minimum (Inductive Load)	250 VAC 5 A minimum (Inductive Load)	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously
SW2			—	—

In order to protect the relay contacts, CR circuit (Ro Co) for surge suppression must be connected.
Ro=5~200Ω Co=0.1~0.2 μF 200WV
Optional of the Oriental Motor's surge absorber is available. Product name **EPCR1201-2** (sold separately)

● Enter **F** or **E** (power supply voltage) in the box (□) with in the model name.
● **How to connect a capacitor**→Page A-225

Note:
● Change the direction of motor rotation only after bringing the motor to a stop. If an attempt is made to change the direction of rotation while the motor is rotating, the motor may ignore the reversing command or change its direction of rotation after some delay.

● Connecting Motor and Speed Control Pack

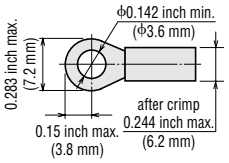
◆ Connecting the motor

Appropriate lead wires

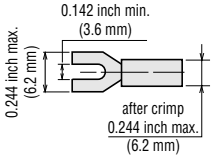
AWG 18 (0.75 mm^2) min.

[Terminals] (Use a crimp terminal for the electromagnetic brake type.)

Round Terminal with Insulation

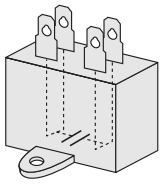


U-Shape Terminal with Insulation



● Inner Connection Diagram for 4-Terminal Capacitor

Terminals of the capacitor are connected as shown in the figure. For lead wire connection, use one lead wire per terminal.



■ List of Motor and Gearhead Combinations

Model numbers for the motor and gearhead combinations are shown below.

● Right-Angle Shaft

Model	Motor Model	Gearhead Model
BHI62FMT-□RH	BHI62FMT-G2	BH6G2-□RH
BHI62FMT-□RA		BH6G2-□RA
BHI62EMT-□RH	BHI62EMT-G2	BH6G2-□RH
BHI62EMT-□RA		BH6G2-□RA
BHI62SMT-□RH	BHI62SMT-G2	BH6G2-□RH
BHI62SMT-□RA		BH6G2-□RA

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

● Parallel Shaft

Model	Motor Model	Gearhead Model
BHI62FMT-□	BHI62FMT-G2	BH6G2-□
BHI62EMT-□	BHI62EMT-G2	
BHI62SMT-□	BHI62SMT-G2	

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