

Electromagnetic Brake Motors

Additional Information

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6 W	A-132
15 W	A-137
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40 W	A-147
60 W	A-152
90 W	A-157
200 W	A-163

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)

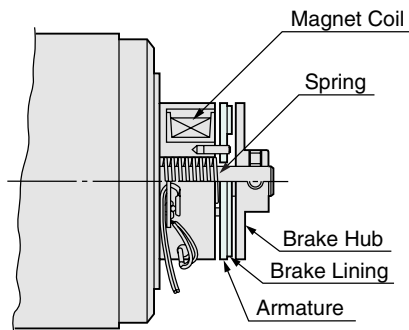
● Wide Variety of Product Lines

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.

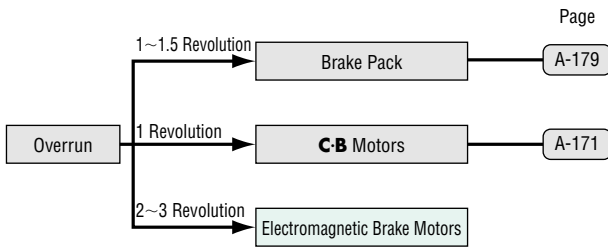
The electromagnetic brake operates on the basis of a spring which presses the armature against the brake hub, stopping the motor and holding the load. When the electromagnetic brake is excited, it attracts the armature and the brake lining is pulled away from the brake hub. The motor is then able to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

Other Motor Braking Options

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

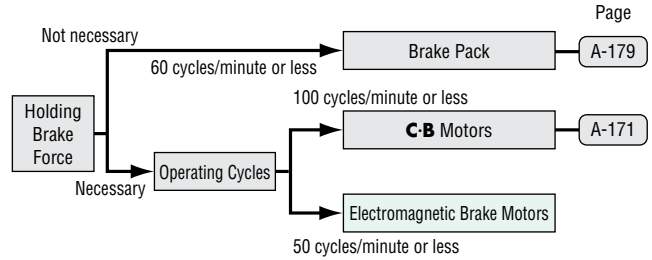
How to Select a Brake Motor

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	114919 (6 W) 6751 (15 W~90 W)*2	
	DEMKO	138642 (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

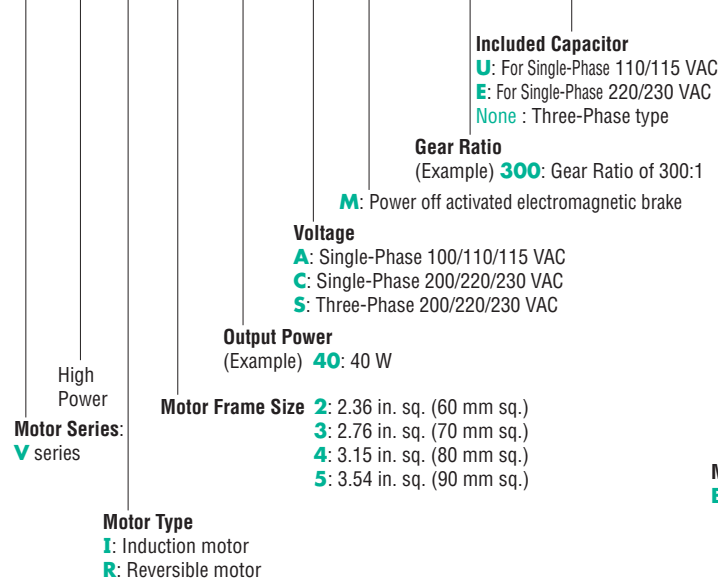
Standards	Certification Body	Standards File No.	CE Marking
UL1004 UL2111	UL	E64197	Low Voltage Directives
CSA C22.2 No.100 CSA C22.2 No.77			
EN60950 EN60034-1 EN60034-5 IEC60034-11 IEC60664-1	Conform to EN/IEC Standards		

● **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.

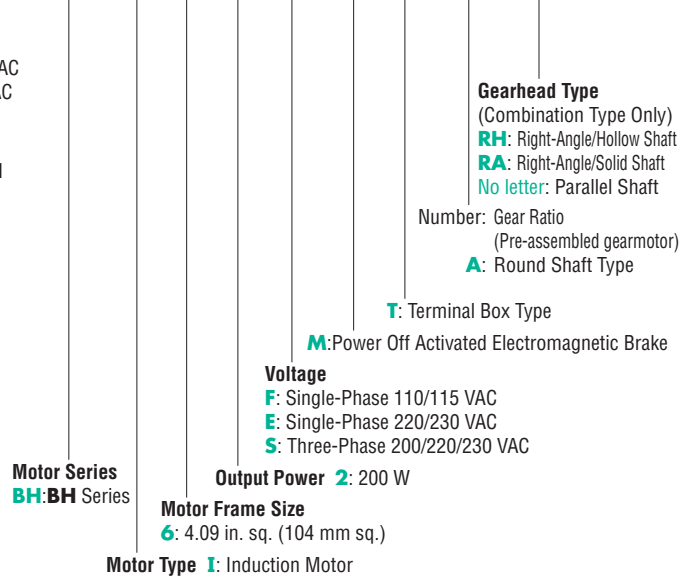
● V Series

VHR540AM-300U



● BH Series

BH162FMT-5RH



■ 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 gearhead 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

Motor Specifications

World K Series (General Purpose)

Model	Rating	Output Power		Voltage VAC	Frequency Hz	Current A	Starting Torque		Rated Torque		Rated Speed r/min	Capacitor μF
		HP	W				oz-in	mN·m	oz-in	mN·m		
^(ZP) 2RK6GN-AWMU 2RK6A-AWMU	30 minutes	1/125	6	Single-Phase 110	60	0.25	6.3	45	5.8	41	1450	3.5
				Single-Phase 115								
^(ZP) 2RK6GN-CWME 2RK6A-CWME	30 minutes	1/125	6	Single-Phase 220	60	0.12	7.1	50	6.9	49	1200	0.8
				Single-Phase 220								
				Single-Phase 230								
				Single-Phase 230								
^(ZP) 2IK6GN-SWM 2IK6A-SWM	Continuous	1/125	6	Three-Phase 200	60	0.09	6.9	49	6.9	49	1200	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

^(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 Combination Type	Rating	Output Power		Voltage VAC	Frequency Hz	Current A	Starting Torque		Rated Torque		Rated Speed r/min	Capacitor μF
		HP	W				oz-in	mN·m	oz-in	mN·m		
^(ZP) VHR206AM-□U	30 minutes	1/125	6	Single-Phase 110	60	0.25	6.3	45	5.8	41	1450	3.5
				Single-Phase 115								
^(ZP) VHR206CM-□E	30 minutes	1/125	6	Single-Phase 220	60	0.12	7.1	50	6.9	49	1200	0.8
				Single-Phase 220								
				Single-Phase 230								
				Single-Phase 230								

^(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 oz-in	Brake Torque mN·m
2RK6GN-AWMU 2RK6A-AWMU	Single-Phase 110	60	0.03	3	4.2	30
	Single-Phase 115					
2RK6GN-CWME 2RK6A-CWME	Single-Phase 220	60	0.02	3	4.2	30
	Single-Phase 220					
	Single-Phase 230					
	Single-Phase 230					
2IK6GN-SWM 2IK6A-SWM	Single-Phase 220	60	0.02	3	4.2	30
	Single-Phase 220					
	Single-Phase 230					

V Series

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

• 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	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	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	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	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

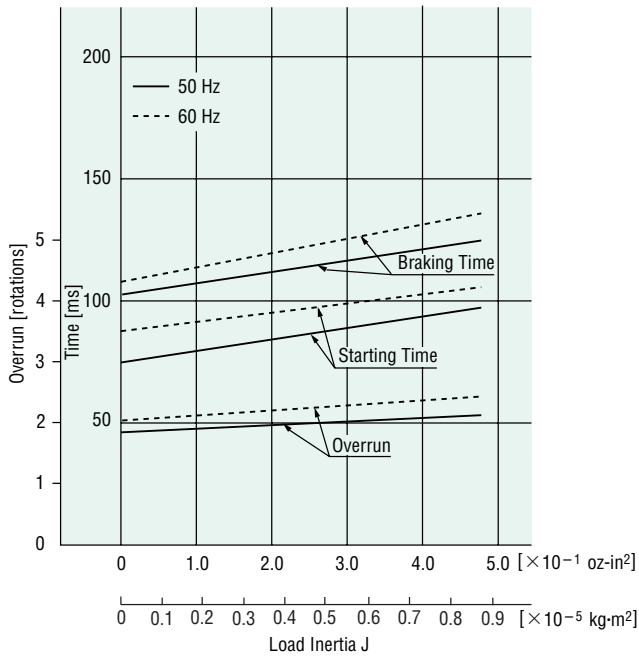
Motor (Round shaft motor) → Page A-11

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

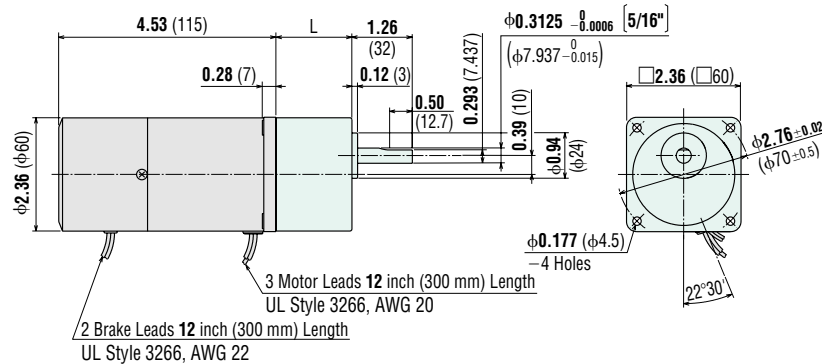
Weight: 2.0 lb. (0.9 kg)

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)

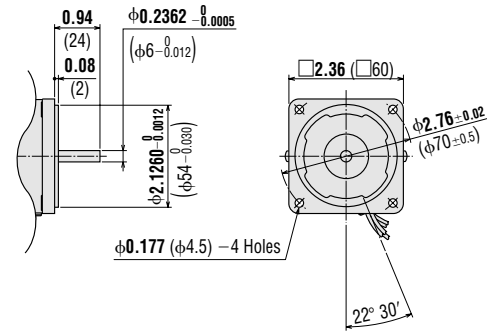
Round Shaft Type

2RK6A-AWMU
2RK6A-CWME
2IK6A-SWM

Weight: 2.0 lb. (0.9 kg)

DXF A346

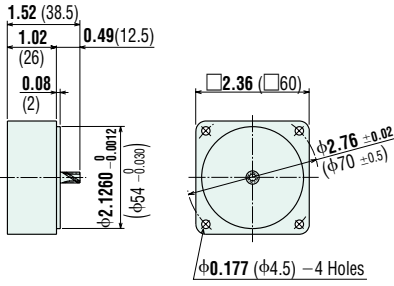
1/4 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.



● **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

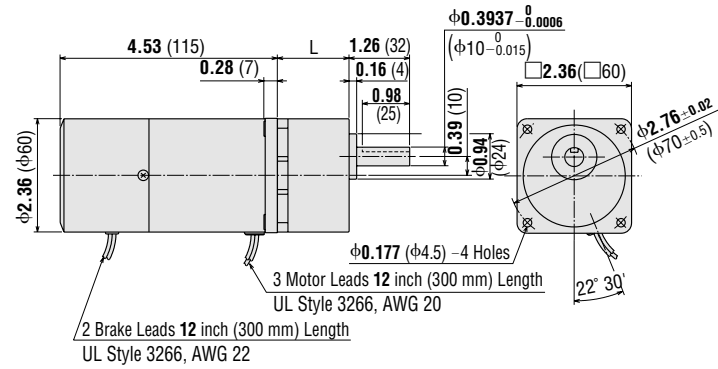
Motor Model: VHR206AM-GV, VHR206CM-GV

Gearhead Model: GV2G□

DXF A213A (GV2G5~18)

A213B (GV2G30~120)

A213C (GV2G180~360)



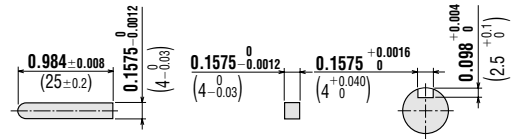
GV2G5-GV2G18: L = 1.34 (34)

GV2G30-GV2G120: L = 1.5 (38)

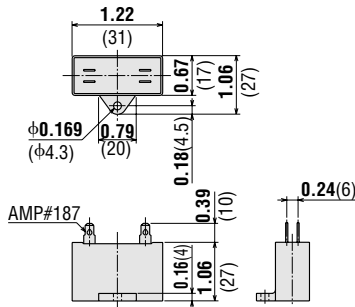
GV2G180-GV2G360: L = 1.69 (43)

● **Key and Key Slot (Scale 1/2)**

(The key is included with the gearhead)



● **Capacitor** (included with single-phase motors)



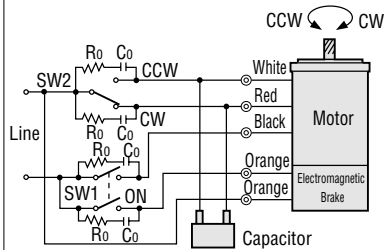
Motor Model	Capacitor Model	Weight oz. (g)
2RK6GN-AWMU 2RK6A-AWMU VHR206AM-□U	CH35FAUL	0.71 (20)
2RK6GN-CWME 2RK6A-CWME VHR206CM-□E	CH08BFAUL	0.71 (20)

- 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).)

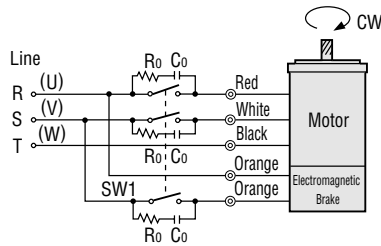
Direction of Rotation

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	250 VAC 1.5 A minimum	Switched Simultaneously
SW2	(Inductive Load)	(Inductive Load)	—

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

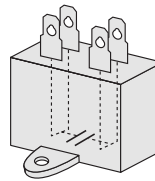
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

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

Motor Specifications

World K Series (General Purpose)



Model	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) 3RK15GN-AWMU 3RK15A-AWMU	30 minutes	1/50	15	Single-Phase 110	60	0.42	14.2	100	14.9	105	1450	6
				Single-Phase 115								
(TP) 3RK15GN-CWME 3RK15A-CWME	30 minutes	1/50	15	Single-Phase 220	60	0.19	14.2	100	17.7	125	1200	1.5
				Single-Phase 220								
				Single-Phase 230								
				Single-Phase 230								

(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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) VHR315AM-□U	30 minutes	1/50	15	Single-Phase 110	60	0.42	14.2	100	14.9	105	1450	6
				Single-Phase 115								
(TP) VHR315CM-□E	30 minutes	1/50	15	Single-Phase 220	60	0.19	14.2	100	17.7	125	1200	1.5
				Single-Phase 220								
				Single-Phase 230								
				Single-Phase 230								

(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 oz-in	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 oz-in	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 (General 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		4.1	5	7.5	12.3	15	23	29	47	71	88	88	88	88
VHR315CM-□E		0.47	0.57	0.85	1.4	1.7	2.7	3.3	5.4	8.1	10	10	10	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

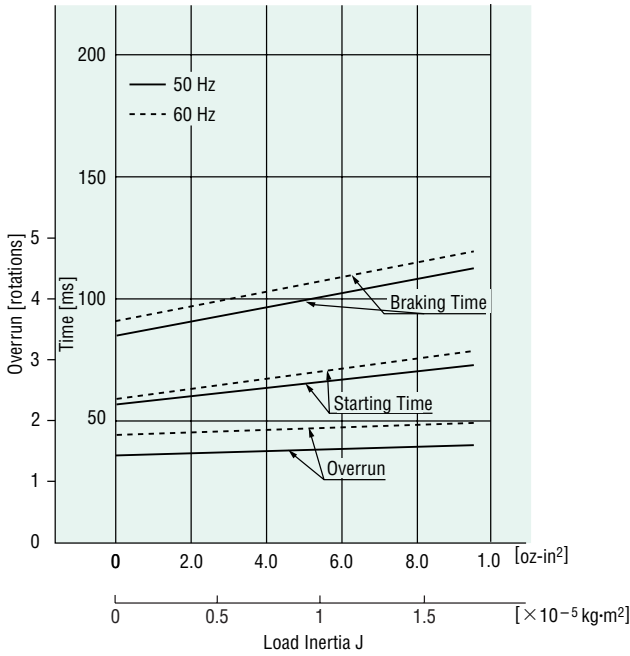
Motor (Round shaft motor) → Page A-11

Gearhead → Page A-11

■ Permissible Load Inertia J for Gearhead

→ Page A-12

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



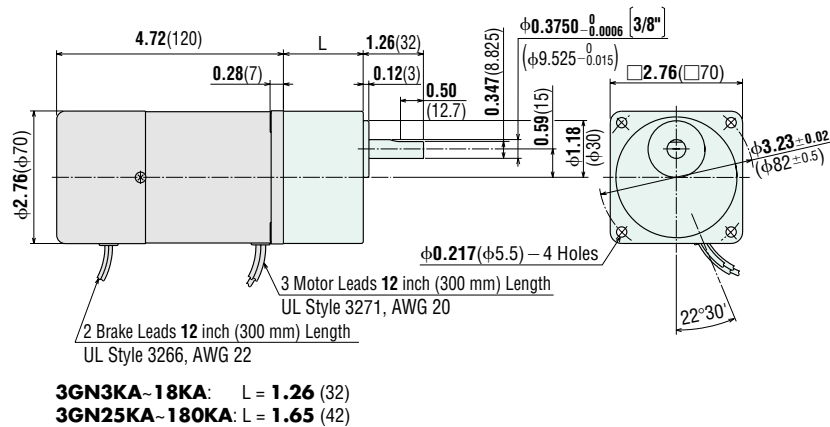
Dimensions Scale 1/4, Unit = inch (mm)

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

World K Series

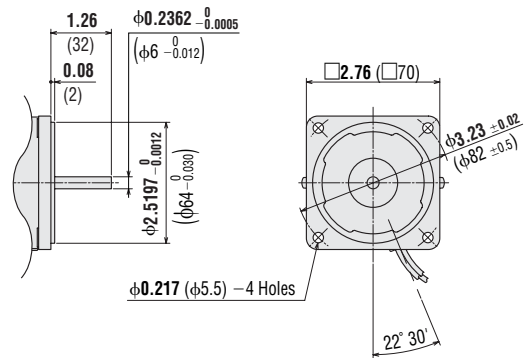
Motor
3RK15GN-AWMU / **3GN□KA**
 Weight: 2.9 lb. (1.3 kg) / Weight: 1.2 lb. (0.55 kg)

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



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

DXF A347

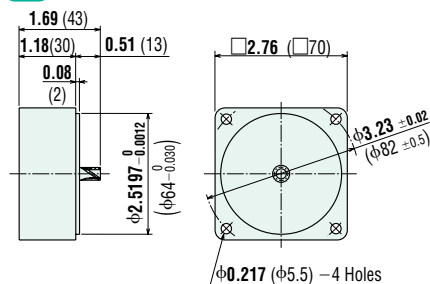


1/4 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.

Decimal Gearhead (for World K Series)

3GN10XK Weight: 0.66 lb. (0.3 kg)

DXF A009



● V Series

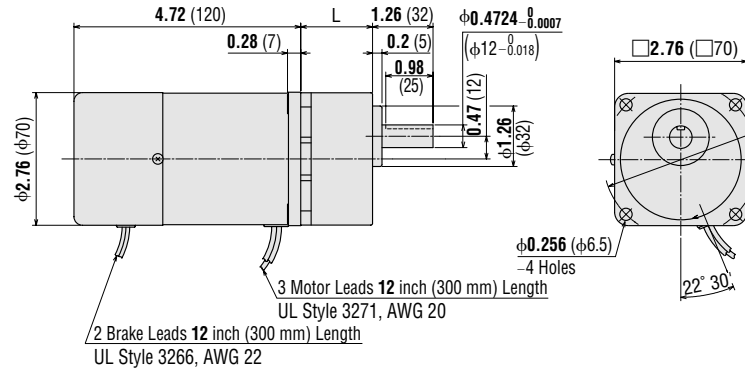
VHR315AM-□U, VHR315CM-□E (Combination Type)

Weight: 4.2 lb. (1.9 kg) including gearhead

Motor Model: VHR315AM-GV, VHR315CM-GV

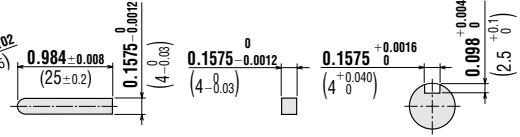
Gearhead Model: GV3G□

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



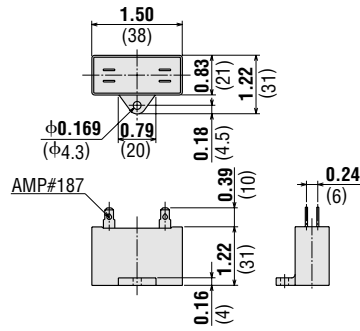
● Key and Key Slot (Scale 1/2)

(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)

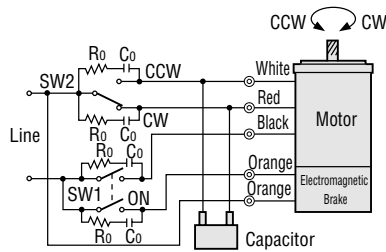


Motor Model	Capacitor Model	Weight oz. (g)
3RK15GN-AWMU		
3RK15A-AWMU	CH60CFAUL	1.4 (40)
VHR315AM-□U		
3RK15GN-CWME		
3RK15A-CWME	CH15BFAUL	1.2 (35)
VHR315CM-□E		

- 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.

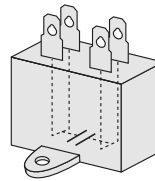
To rotate the motor in a counterclockwise (CCW) direction, flip SW2 to CCW.

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

Introduction

Induction Motors

Reversible Motors

Synchronous Motors

Torque Motors

Waterlight Motors

Magnetic Brake

Clutch & Brake

Brake Pack

Right-Angle Gearheads

Accessories

Before Using a Standard AC Motor

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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) 4RK25GN-AWMU 4RK25A-AWMU	30 minutes	1/30	25	Single-Phase 110	60	0.54	19.8	140	24	170	1450	8
	Single-Phase 115											
(TP) 4RK25GN-CWME 4RK25A-CWME	30 minutes			Single-Phase 220	50	0.28	19.8	140	24	170	1450	2
	Single-Phase 230											
	Single-Phase 230											
(TP) 4IK25GN-SWM 4IK25A-SWM	Continuous			Three-Phase 200	60	0.23	34	240	26	190	1300	—
	Three-Phase 200											
	Three-Phase 220											
	Three-Phase 230											

(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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) VHR425AM-□U	30 minutes	1/30	25	Single-Phase 110	60	0.54	19.8	140	24	170	1450	8
	Single-Phase 115											
(TP) VHR425CM-□E	30 minutes			Single-Phase 220	50	0.28	19.8	140	24	170	1450	2
	Single-Phase 230											
	Single-Phase 230											
(TP) VHI425SM-□	Continuous			Three-Phase 200	60	0.23	34	240	26	190	1300	—
	Three-Phase 200											
	Three-Phase 220											
	Three-Phase 230											

(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	Frequency	Current	Input	Holding	Brake	Torque
	VAC	Hz	A	W	oz-in	mN-m	
4RK25GN-AWMU 4RK25A-AWMU	Single-Phase 110 Single-Phase 115	60	0.09	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	7	14.2	100	

V Series

Model	Voltage	Frequency	Current	Input	Holding	Brake	Torque
	VAC	Hz	A	W	oz-in	mN-m	
VHR425AM-□U	Single-Phase 110 Single-Phase 115	60	0.09	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	0.05	7	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-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 Gear Ratio	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
		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 Gear Ratio	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
		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 Gear Ratio	360	300	200	120	100	60	50	30	20	15	10	6	5
		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 Gear Ratio	300	250	166	100	83	50	41	25	16	12.5	8.3	5	4.2
		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.

■ 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

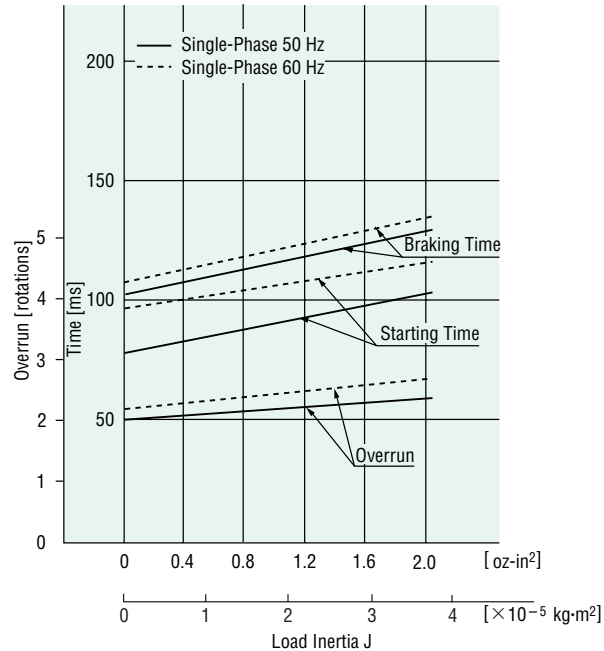
Gearhead→Page A-11

■ Permissible Load Inertia J for Gearhead

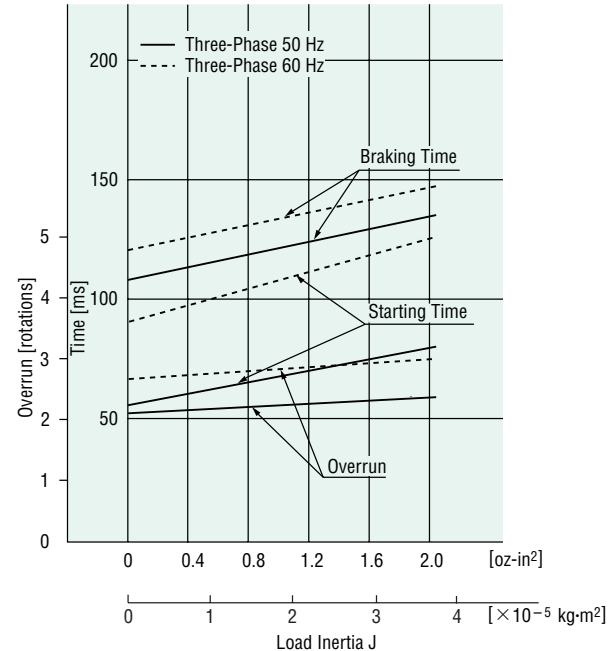
→Page A-12

■ 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 / Gearhead

4RK25GN-AWMU
4RK25GN-CWME
4IK25GN-SWM

Weight: 4.4 lb. (2.0 kg)

4GN□KA

Weight: 1.4 lb. (0.65 kg)

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

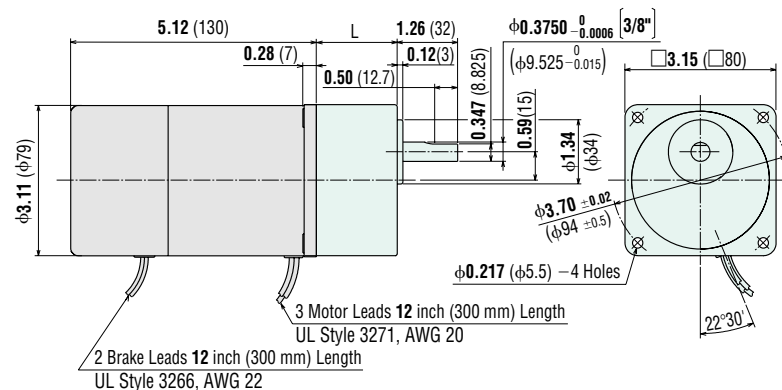
Round Shaft Type

4RK25A-AWMU
4RK25A-CWME
4IK25A-SWM

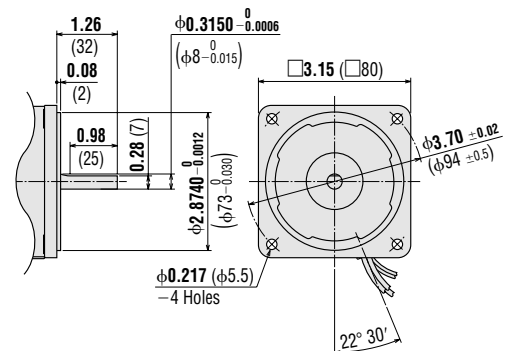
Weight: 4.4 lb. (2.0 kg)

DXF A348

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



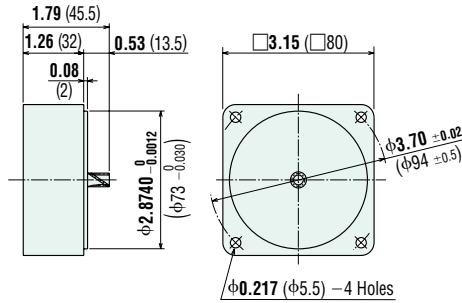
4GN3KA~18KA: L = 1.26 (32)
4GN25KA~180KA: L = 1.67 (42.5)



● **Decimal Gearhead (for World K Series)**

4GN10XK Weight: 0.88 lb. (0.4 kg)

DXF A013



● **V Series**

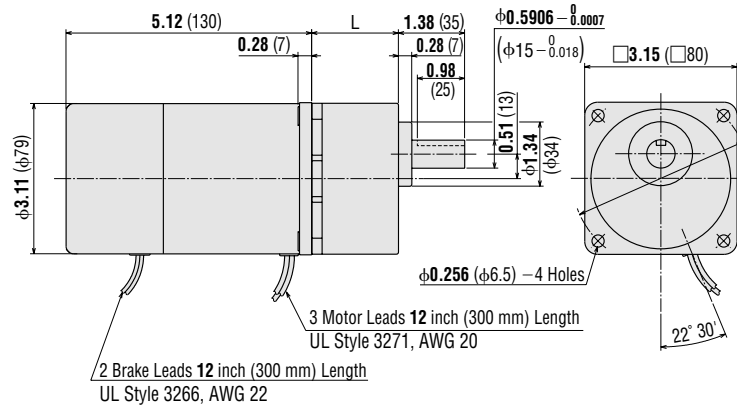
VHR425AM-□U, VHR425CM-□E, VHI425SM-□ (Combination Type)

Weight: 6.6 lb. (3.0 kg)

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

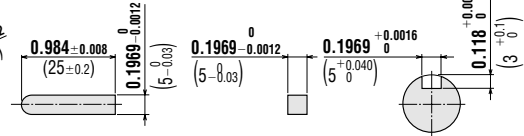
Gearhead Model: GV4G□

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



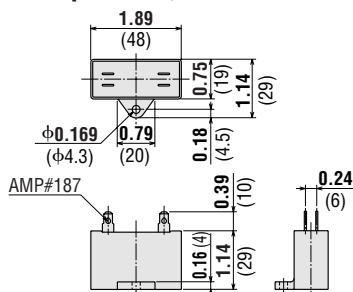
● **Key and Key Slot (Scale 1/2)**

(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)



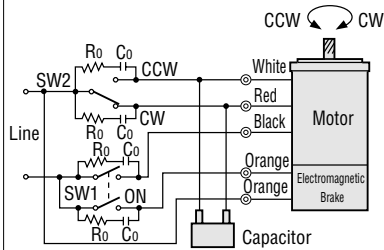
Motor Model	Capacitor Model	Weight oz. (g)
4RK25GN-AWMU 4RK25A-AWMU VHR425AM-□U	CH80CFAUL	1.4(40)
4RK25GN-CWME 4RK25A-CWME VHR425CM-□E	CH20BFAUL	1.2 (35)

● 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

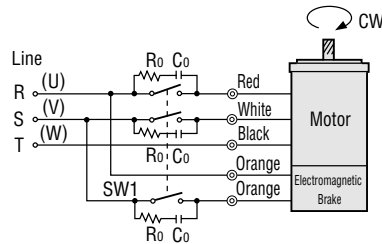
To rotate the motor in a clockwise (CW) direction, flip SW2 to CW.

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	250 VAC 1.5 A minimum	Switched Simultaneously
SW2	(Inductive Load)	(Inductive Load)	—

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

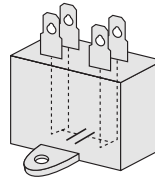
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) 5RK40GN-AWMU 5RK40A-AWMU	30 minutes			Single-Phase 110	60	0.81	36	260	38	270	1450	12
				Single-Phase 115								
(TP) 5RK40GN-CWME 5RK40A-CWME	30 minutes			Single-Phase 220	50	0.46	36	260	36	260	1500	3.5
				Single-Phase 230								
				Single-Phase 230								
(TP) 5IK40GN-SWM 5IK40A-SWM	Continuous			Three-Phase 200	60	0.32	56	400	42	300	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

(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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) VHR540AM-□U	30 minutes			Single-Phase 110	60	0.81	36	260	38	270	1450	12
				Single-Phase 115								
(TP) VHR540CM-□E	30 minutes			Single-Phase 220	50	0.40	38	270	44	315	1250	3.5
				Single-Phase 230								
				Single-Phase 230								
(TP) VHI540SM-□	Continuous			Three-Phase 200	60	0.32	56	400	42	300	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

(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	Frequency	Current	Input	Holding	Brake	Torque
	VAC	Hz	A	W	oz-in	mN·m	
5RK40GN-AWMU 5RK40A-AWMU	Single-Phase 110	60	0.09	6	28	200	
	Single-Phase 115	60					
5RK40GN-CWME 5RK40A-CWME	Single-Phase 220	60	0.05	7	28	200	
	Single-Phase 230	50					
	Single-Phase 230	60					
5IK40GN-SWM 5IK40A-SWM	Single-Phase 200	50	0.05	7	28	200	
	Single-Phase 200	60					
	Single-Phase 220	60					
	Single-Phase 230	60					

V Series

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

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

■ 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	Gear Ratio																			
		600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
5SRK40GN-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
5SRK40GN-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	Gear Ratio																			
		500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
5SRK40GN-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	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	Gear Ratio											
		360	300	200	120	100	60	50	30	20	15	10	6
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-□E	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	Gear Ratio											
		300	250	166	100	83	50	41	25	16	12.5	8.3	5
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

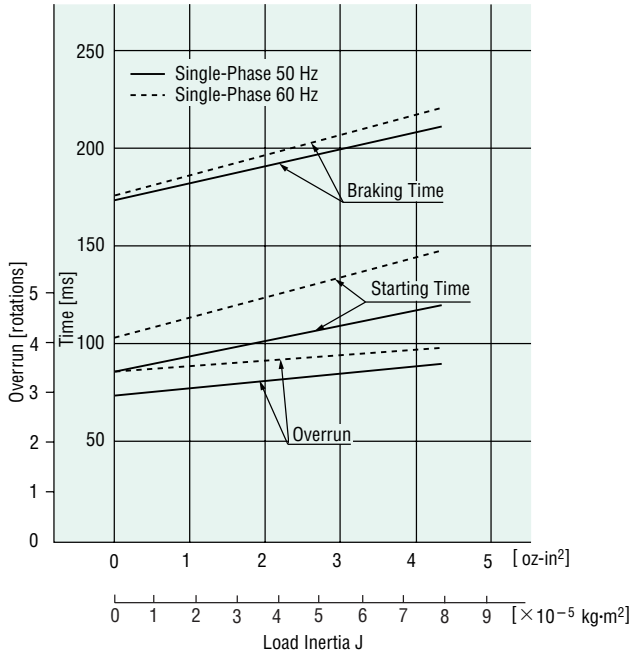
Gearhead →Page A-11

■ Permissible Load Inertia J for Gearhead

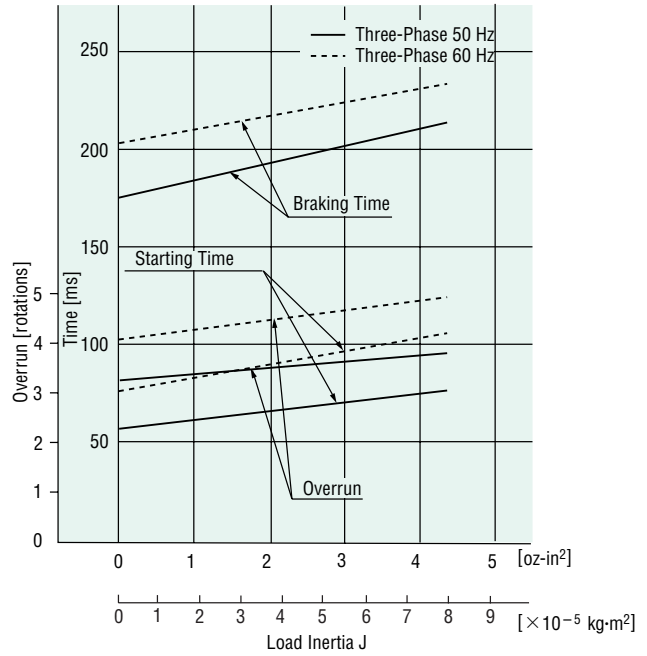
→Page A-12

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: 6.2 lb. (2.8 kg)

Gearhead

5GN□KA

Weight: 3.3 lb. (1.5 kg)

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

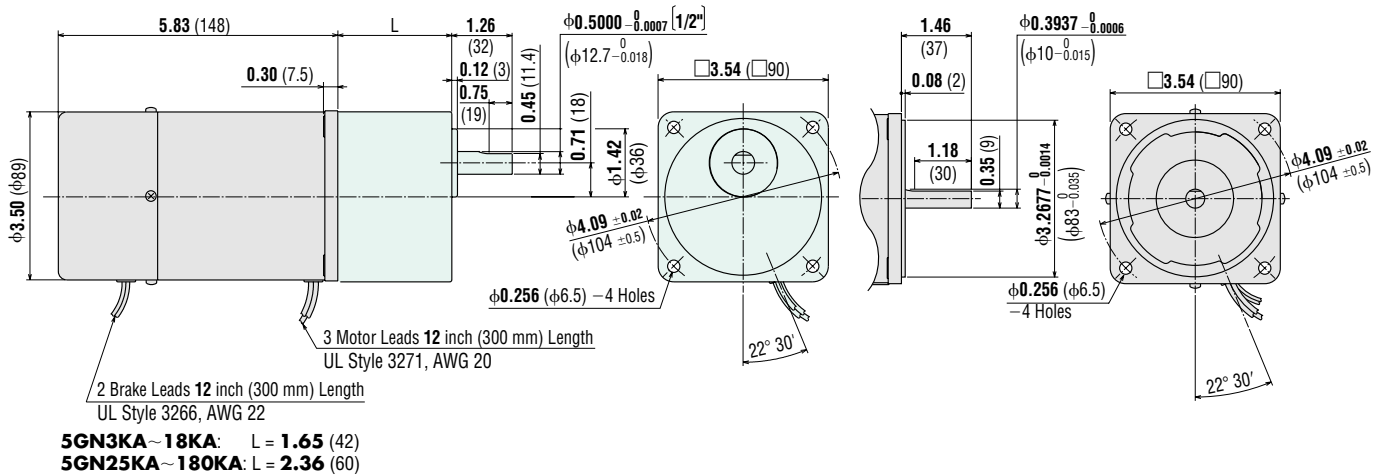
Round Shaft Type

5RK40A-AWMU
5RK40A-CWME
5IK40A-SWM

Weight: 6.4 lb. (2.9 kg)

DXF A349

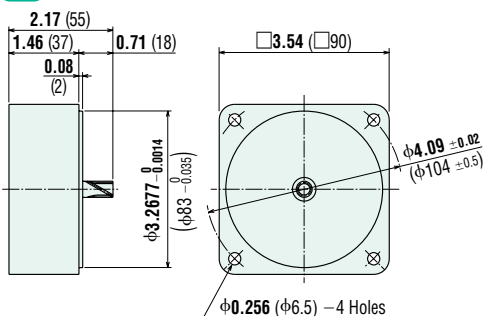
3/8 inch shaft motors are also available. Contact your Oriental Motor Representative for more information.



Decimal Gearhead (for World K Series)

5GN10XK Weight: 1.3 lb. (0.6 kg)

DXF A022



● **V Series**

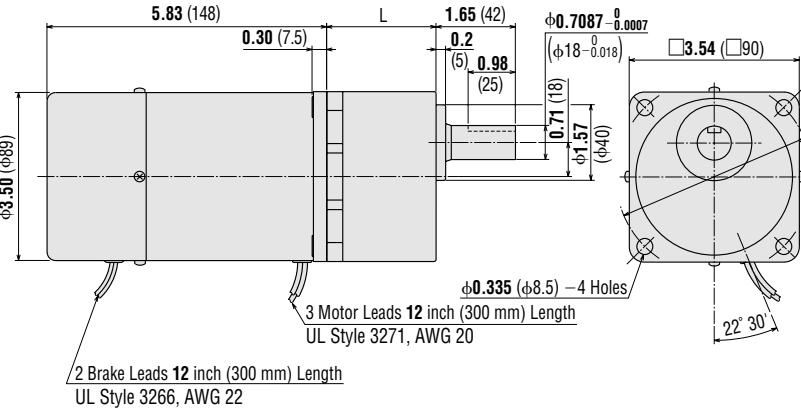
VHR540AM-□U, VHR540CM-□E, VHI540SM-□ (Combination Type)

Weight: 9.7 lb. (4.4 kg) including gearhead

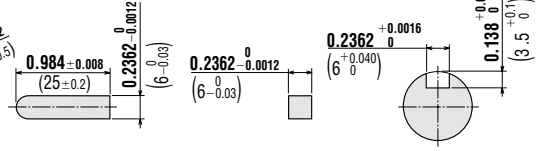
Motor Model: VHR540AM-GVH, VHR540CM-GVH, VHI540SM-GVH

Gearhead Model: GVH5G□

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

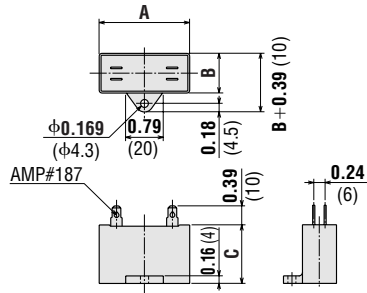


● **Key and Key Slot (Scale 1/2)**
 (The key is provided with the gearhead)



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

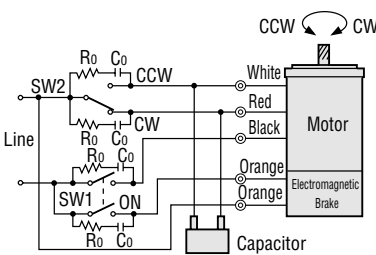
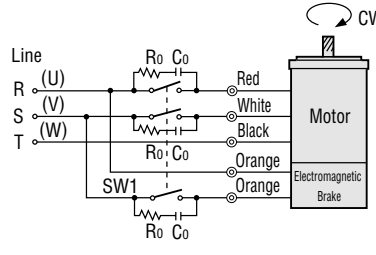
● **Capacitor** (included with single-phase motors)



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

- 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.

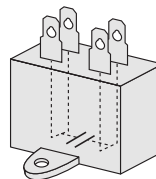
Connection Diagrams

Single-Phase Motor	<p>5RK40GN-AWMU 5RK40GN-CWME VHR540AM-□U VHR540CM-□E</p>		<p>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).)</p> <p>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.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Switch No.</th> <th colspan="2">Specifications</th> <th rowspan="2">Note</th> </tr> <tr> <th>Single-Phase 110 VAC Input Single-Phase 115 VAC Input</th> <th>Single-Phase 220 VAC Input Single-Phase 230 VAC Input</th> </tr> </thead> <tbody> <tr> <td>SW1</td> <td>125 VAC 5 A minimum</td> <td>250 VAC 5 A minimum</td> <td>Switched Simultaneously</td> </tr> <tr> <td>SW2</td> <td>(Inductive Load)</td> <td>(Inductive Load)</td> <td>—</td> </tr> </tbody> </table>	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	250 VAC 5 A minimum	Switched Simultaneously	SW2	(Inductive Load)	(Inductive Load)	—
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	250 VAC 5 A minimum	Switched Simultaneously														
SW2	(Inductive Load)	(Inductive Load)	—														
Three-Phase Motor	<p>5IK40GN-SWM VHI540SM-□</p>		<p>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).)</p> <p>Direction of Rotation To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Switch No.</th> <th>Specifications</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>SW1</td> <td>250 VAC 5 A minimum (Inductive Load)</td> <td>Switched Simultaneously</td> </tr> </tbody> </table>	Switch No.	Specifications	Note	SW1	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously								
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)]
EPCR 1201-2 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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) 5RK60GU-AWMU 5RK60A-AWMU	30 minutes	1/12	60	Single-Phase 110	60	1.24	53	380	57	405	1450	20
				Single-Phase 115								
(TP) 5RK60GU-CWME 5RK60A-CWME	30 minutes	1/12	60	Single-Phase 220	60	0.67	53	380	57	405	1450	5
				Single-Phase 230								
				Single-Phase 230								
(TP) 5IK60GU-SWM 5IK60A-SWM	Continuous	1/12	60	Three-Phase 200	60	0.50	85	600	63	450	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

(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	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W				oz-in	mN·m	oz-in	mN·m		
(TP) VHR560AM-□U	30 minutes	1/12	60	Single-Phase 110	60	1.24	53	380	57	405	1450	20
				Single-Phase 115								
(TP) VHR560CM-□E	30 minutes	1/12	60	Single-Phase 220	60	0.67	53	380	57	405	1450	5
				Single-Phase 230								
				Single-Phase 230								
(TP) VHI560SM-□	Continuous	1/12	60	Three-Phase 200	60	0.50	85	600	63	450	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

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

V Series

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

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	Gear Ratio																			
		600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
5RK60GU-AWMU / 5GU□KA 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	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	177 20

◆ Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min	Gear Ratio																			
		500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
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	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	Gear Ratio										
		360	300	200	120	100	60	50	30	20	15	10
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	Gear Ratio										
		300	250	166	100	83	50	41	25	16	12.5	8.3
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

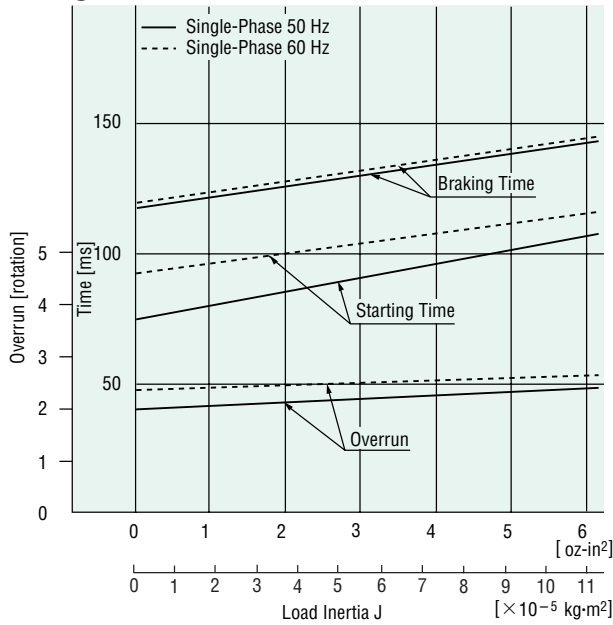
Gearhead→Page A-11

■ Permissible Load Inertia J for Gearhead

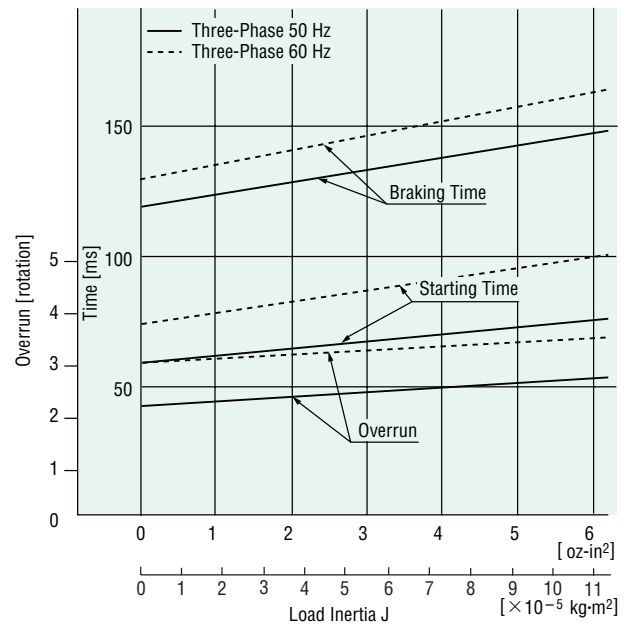
→Page A-12

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

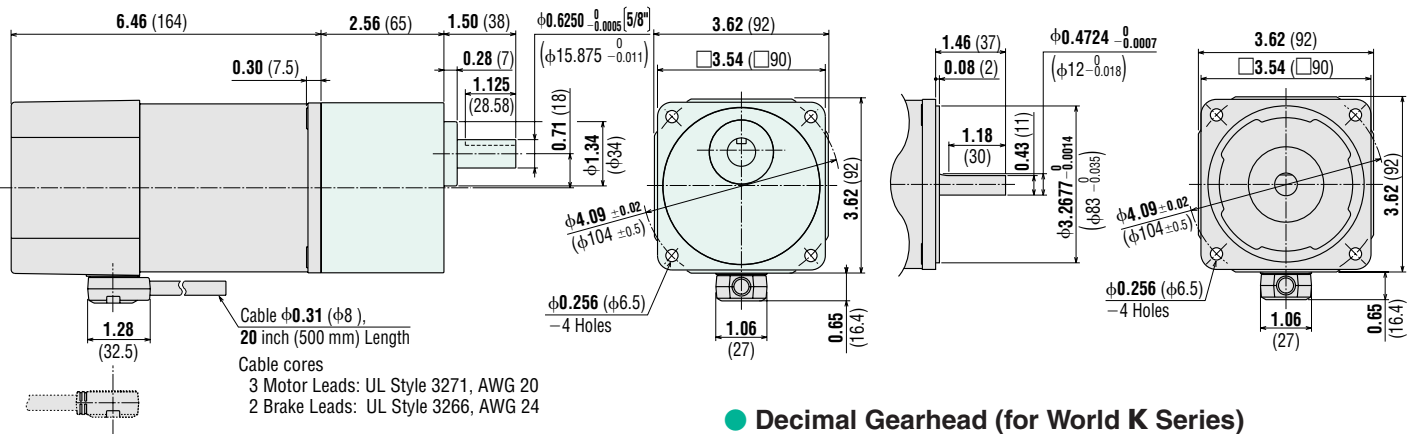
Motor	Gearhead
5RK60GU-AWMU	5GU□KA
5RK60GU-CWME	
5IK60GU-SWM	
Weight: 7.5 lb. (3.4 kg)	Weight: 3.3 lb. (1.5 kg)

DXF A090U (5GU3KA~180KA)

Round Shaft Type

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

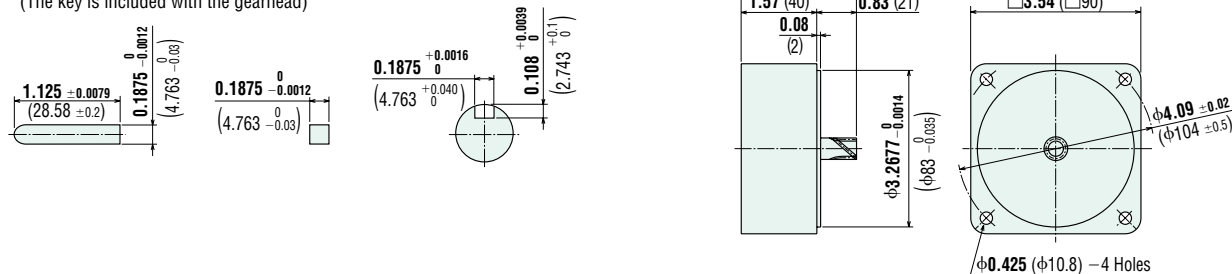
DXF A350



Cable direction can be switched to the opposite direction.

Key and Key Slot (Scale 1/2)

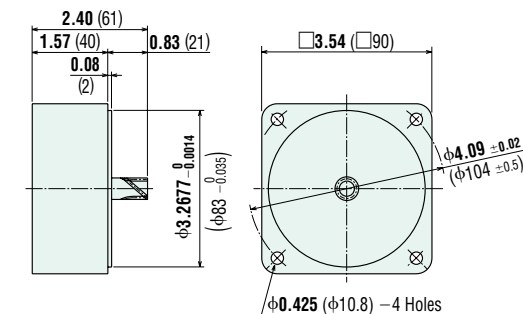
(The key is included with the gearhead)



Decimal Gearhead (for World K Series)

5GU10XKB Weight: 1.3 lb. (0.6 kg)

DXF A029



● **V Series**

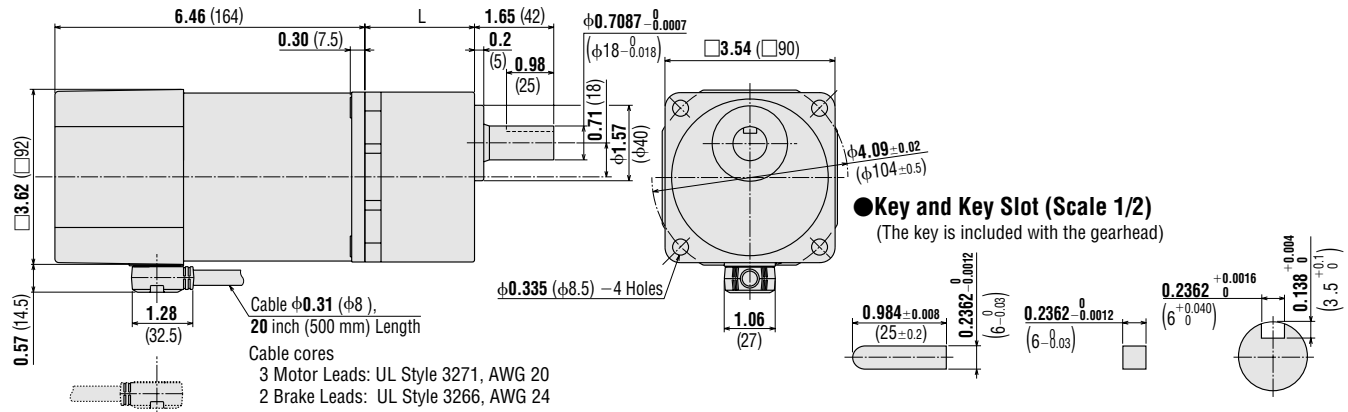
VHR560AM-□U, VHR560CM-□E, VHI560SM-□ (Combination Type)

Weight: 11 lb. (4.9 kg) including gearhead

Motor Model: VHR560AM-GVH, VHR560CM-GVH, VHI560SM-GVH

Gearhead Model: GVH5G□

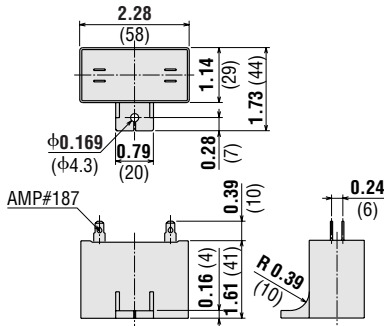
- DXF A246A (GVH5G5~18)
- A246B (GVH5G30~90)
- A246C (GVH5G120~300)



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	CH200CFAUL	3.4 (95)
VHR560AM-□U		
5RK60GU-CWME		
5RK60A-CWME	CH50BFAUL	3.0 (85)
VHR560CM-□E		

- 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.

Introduction

Induction Motors

Reversible Motors

Synchronous Motors

Torque Motors

Waterlight Motors

Magnetic Brake

Clutch & Brake

Brake Pack

Right-Angle Gearheads

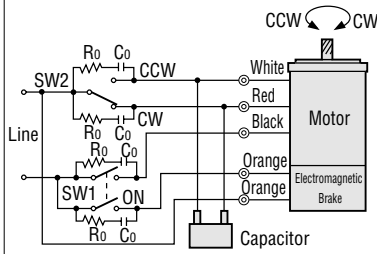
Accessories

Before Using a Standard AC Motor

Connection Diagrams

Single-Phase Motor

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



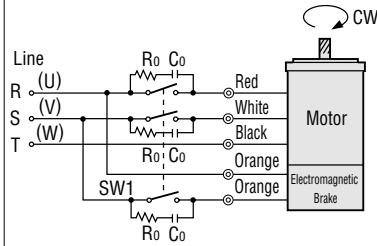
SW1 operates both motor and electromagnetic brake action. The motor will rotate when SW1 is switched simultaneously to ON (short circuit). When SW1 is switched simultaneously to OFF (open), the motor stops immediately with the electromagnetic brake and holds the load.
(To release the brake while the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

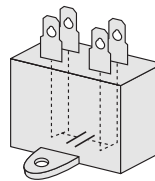
Direction of Rotation
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

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.



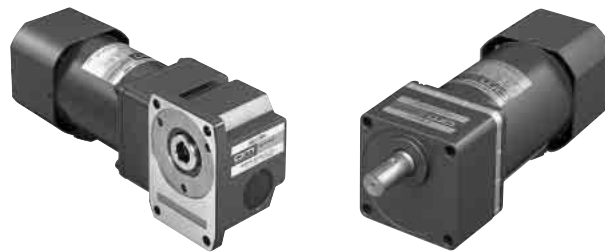
List of Motor and Gearhead Combinations for V Series

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 Pinion Shaft Type Round Shaft Type	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
Ⓢ 5RK90GU-AWMU 5RK90A-AWMU	30 minutes	1/8 90		Single-Phase 110	60	1.81	83	590	83	585	1500	30
				Single-Phase 115								
Ⓢ 5RK90GU-CWME 5RK90A-CWME	30 minutes	1/8 90		Single-Phase 220	50	0.96	85	600	103	730	1200	7
				Single-Phase 230								
				Single-Phase 230								
Ⓢ 5IK90GU-SWM 5IK90A-SWM	Continuous	1/8 90		Three-Phase 200	50	0.64	120	850	96	680	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

Ⓢ 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 Combination Type	Rating	Output Power		Voltage	Frequency	Current	Starting Torque		Rated Torque		Rated Speed	Capacitor
		HP	W	VAC	Hz	A	oz-in	mN·m	oz-in	mN·m	r/min	μF
Ⓢ VHR590AM-□U	30 minutes	1/8 90		Single-Phase 110	60	1.81	83	590	83	585	1500	30
				Single-Phase 115								
Ⓢ VHR590CM-□E	30 minutes	1/8 90		Single-Phase 220	50	0.96	85	600	103	730	1200	7
				Single-Phase 220								
				Single-Phase 230								
Ⓢ VHI590SM-□	Continuous	1/8 90		Three-Phase 200	50	0.64	120	850	96	680	1300	—
				Three-Phase 200								
				Three-Phase 220								
				Three-Phase 230								

Ⓢ 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 oz-in	Brake Torque mN·m
5RK90GU-AWMU 5RK90A-AWMU	Single-Phase 110	60	0.13	10	71	500
	Single-Phase 115					
5RK90GU-CWME 5RK90A-CWME	Single-Phase 220	50	0.07	10	71	500
	Single-Phase 230					
	Single-Phase 230					
5IK90GU-SWM 5IK90A-SWM	Single-Phase 200	50	0.07	10	71	500
	Single-Phase 200					
	Single-Phase 220					
	Single-Phase 230					

V Series

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

• 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
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 Gear Ratio	600	500	360	300	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
		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-powered gearhead.

◆ Single-Phase 230 VAC 50 Hz

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

Model	Speed r/min Gear Ratio	500	416	300	250	200	166	120	100	83	60	50	41	30	25	20	16	15	12.5	10	8.3
		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-powered 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 Gear Ratio	360	300	200	120	100	60	50	30	20	15	10
		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 Gear Ratio	300	250	166	100	83	50	41	25	16	12.5	8.3
		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

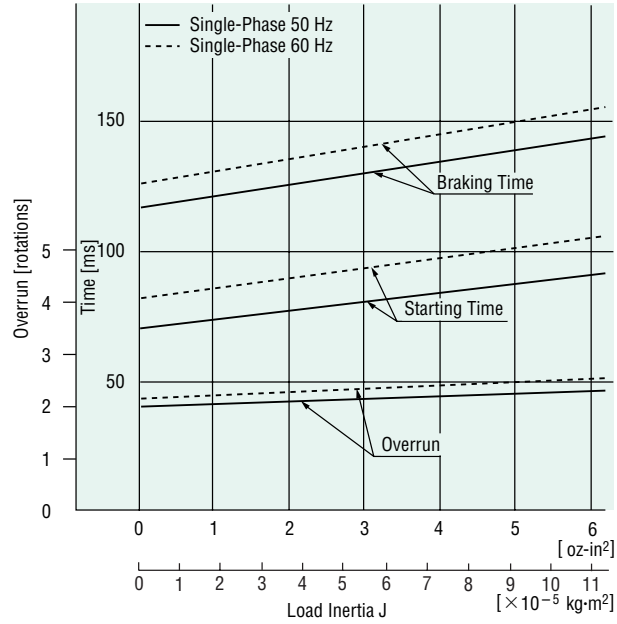
Gearhead→Page A-11

■ Permissible Load Inertia J for Gearhead

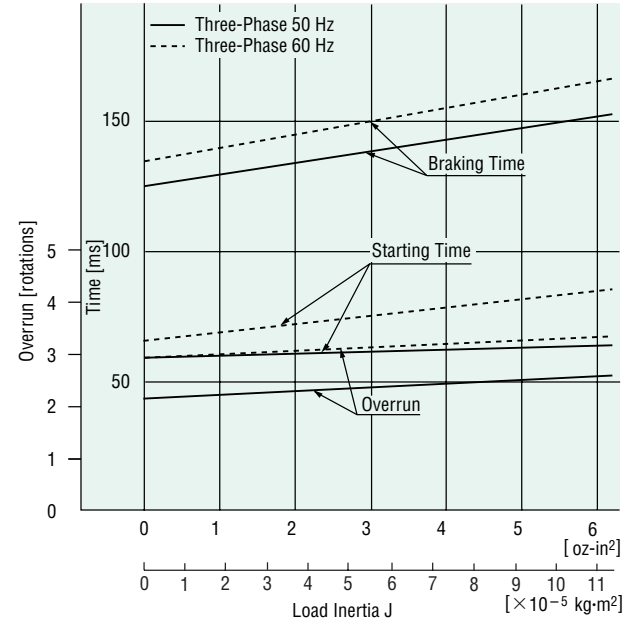
→Page A-12

■ 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)

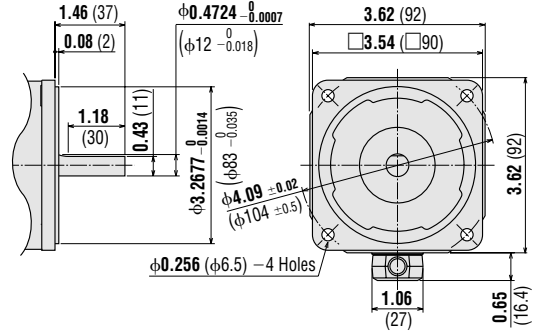
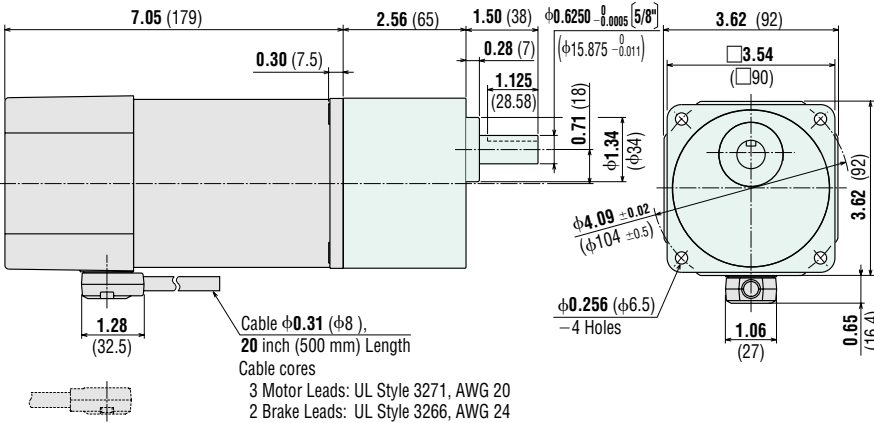
DXF A091U (5GU3KA~180KA)

Round Shaft Type

5RK90A-AWMU
5RK90A-CWME
5IK90A-SWM

Weight: 8.6 lb. (3.9 kg)

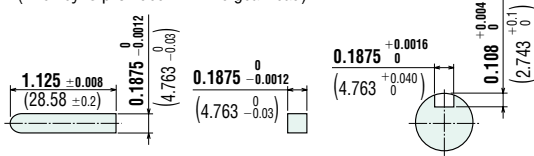
DXF A351



Cable direction can be switched to the opposite direction.

Key and Key Slot (Scale 1/2)

(The key is provided with the gearhead)

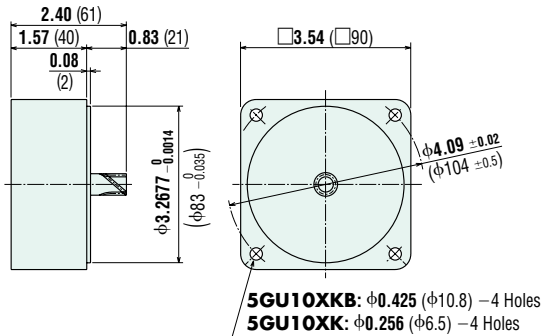


Decimal Gearheads (for World K Series)

5GU10XKB (for 5GU□KA)
5GU10XK (for 5GU□KHA)

Weight: 1.3 lb. (0.6 kg)

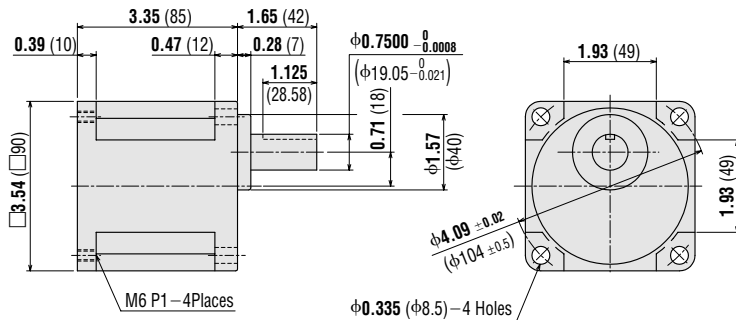
DXF A029



High-Power Type Gearhead (for World K Series)

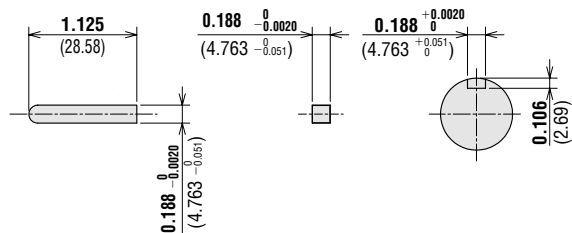
5GU□KHA Weight: 4.2 lb. (1.9 kg)

DXF A038U



Key and Key Slot (Scale 1/2)

(The key is provided with the gearhead)



● V Series

◆ Lead Wire Type

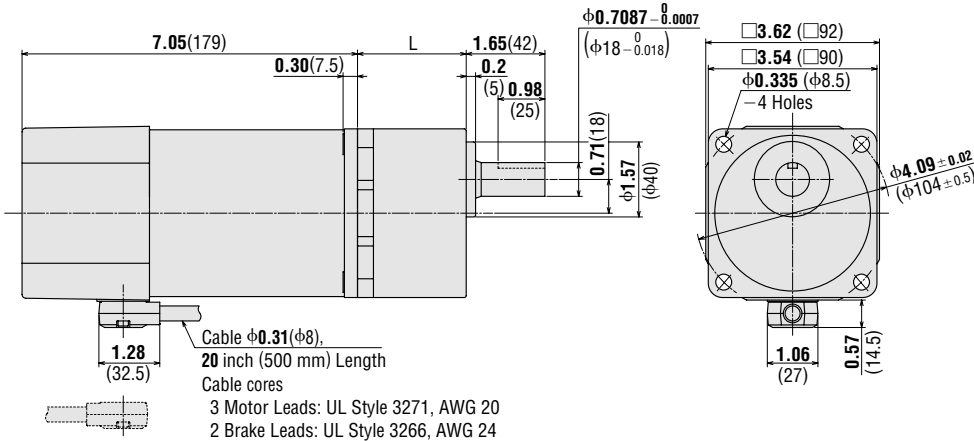
VHR590AM-□U, VHR590CM-□E, VHI590SM-□ (Combination Type)

Weight: 12 lb. (5.4 kg) including gearhead

Motor Model: VHR590AM-GVR, VHR590CM-GVR, VHI590SM-GVR

Gearhead Model: GVR5G□

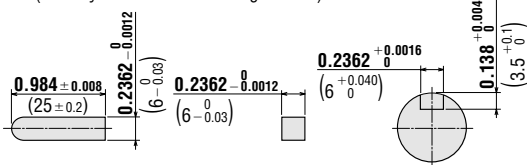
- DXF** A399A (GVR5G5~15)
- A399B (GVR5G18~36)
- A399C (GVR5G60~180)



Cable direction can be switched to the opposite direction.

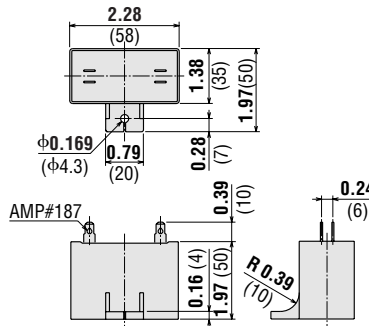
● Key and Key Slot (Scale 1/2)

(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)



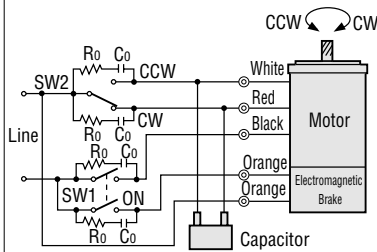
Motor Model	Capacitor Model	Weight oz. (g)
5RK90GU-AWMU		
5RK90A-AWMU	CH300CFAUL	4.9 (140)
VHR590AM-□U		
5RK90GU-CWME		
5RK90A-CWME	CH70BFAUL	4.6 (130)
VHR590CM-□E		

- 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-AWUM
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).)

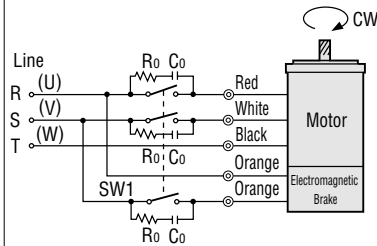
Direction of Rotation

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 230 VAC Input	
SW1	125 VAC 5 A minimum	250 VAC 5 A minimum	Switched Simultaneously
SW2	(Inductive Load)	(Inductive Load)	—

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

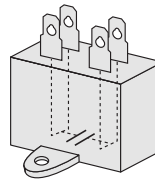
To rotate the motor in a counterclockwise direction, change any two connections between U, V and W.

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	

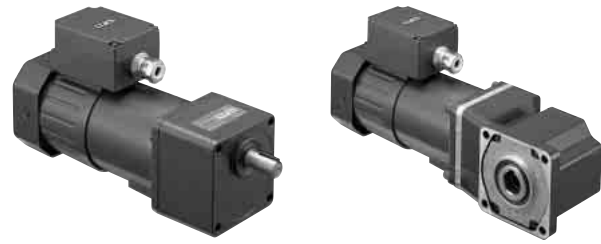
- Enter the gear ratio in the box (□) within the model name.

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	r/min	μF		
(TP) BHI62FMT-<input type="checkbox"/>RH BHI62FMT-<input type="checkbox"/>RA BHI62FMT-<input type="checkbox"/>	BHI62FMT-A	1/4	200	Single-Phase 110	60	3	124	0.88	1500	40		
				Single-Phase 115			139	0.98				
(TP) BHI62EMT-<input type="checkbox"/>RH BHI62EMT-<input type="checkbox"/>RA BHI62EMT-<input type="checkbox"/>	BHI62EMT-A	1/4	200	Single-Phase 220	60	1.5	139	0.98	1500	10		
				Single-Phase 230			50	1.5			210	1.52
				60			139	0.98			180	1.27
(TP) BHI62SMT-<input type="checkbox"/>RH BHI62SMT-<input type="checkbox"/>RA BHI62SMT-<input type="checkbox"/>	BHI62SMT-A	1/4	200	Three-Phase 200	60	1.1	210	1.49	1500	—		
				60			177	1.25				
				Three-Phase 220			60	0.95			174	1.23
				Three-Phase 230	60	0.95	167	1.18	167	1.18		

(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-<input type="checkbox"/>RH BHI62FMT-<input type="checkbox"/>RA BHI62FMT-<input type="checkbox"/> BHI62FMT-A	Single-Phase 110	60	0.17	12	210	1.5
	Single-Phase 115					
BHI62EMT-<input type="checkbox"/>RH BHI62EMT-<input type="checkbox"/>RA BHI62EMT-<input type="checkbox"/> BHI62EMT-A	Single-Phase 220	60	0.09	12	210	1.5
	Single-Phase 230					
BHI62SMT-<input type="checkbox"/>RH BHI62SMT-<input type="checkbox"/>RA BHI62SMT-<input type="checkbox"/> BHI62SMT-A	Single-Phase 200	60	0.09	12	210	1.5
	50					
	60					
	Single-Phase 220	60	0.09	12	210	1.5
Single-Phase 230						

• 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.

● 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.

◆ 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.

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		49	73	123	147	240	290	380	450	530	530
		5.6	8.3	13.9	16.7	27.8	33.4	43	51.5	60	60
BHI62EMT-□RH, BHI62EMT-□RA		46	69	114	137	220	270	380	450	530	530
		5.2	7.8	12.9	15.5	25.8	31	43	51.5	60	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	88	146	177	290	310	380	450	530	530
		6.7	10	16.6	20	33.3	36	43	51.5	60	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	61	91	145	174	290	340	350	350	350	350
		4.1	6.9	10.3	16.4	19.7	32.8	39.3	40	40	40	40
BHI62SMT-□ (230 VAC)		33	56	84	134	161	260	320	350	350	350	350
		3.8	6.4	9.6	15.2	18.3	30.4	36.5	40	40	40	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	72	108	173	200	340	350	350	350	350	350
		4.9	8.2	12.3	19.6	23.5	39.2	40	40	40	40	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

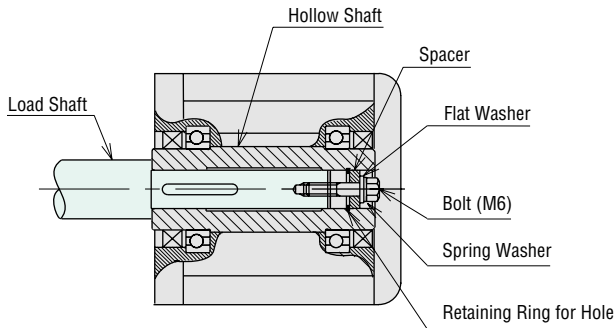
Round Shaft Motor →Page A-11

■ Permissible Load Inertia J for Gearhead

→Page A-12

■ Mounting Method of Hollow Shaft Gearheads

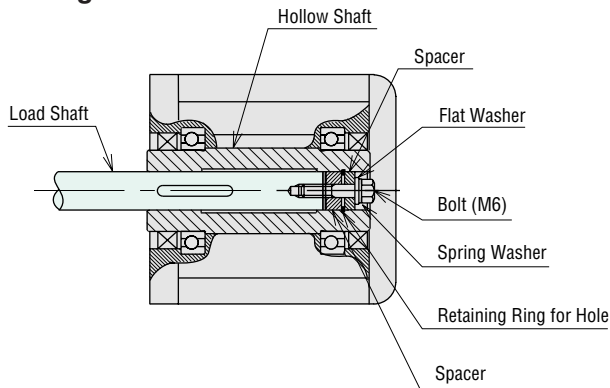
● Stepped-Down Shaft



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.

● Straight Load Shaft



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	$\phi 0.9843^{+0.0008}_0$ ($\phi 25^{+0.021}_0$)

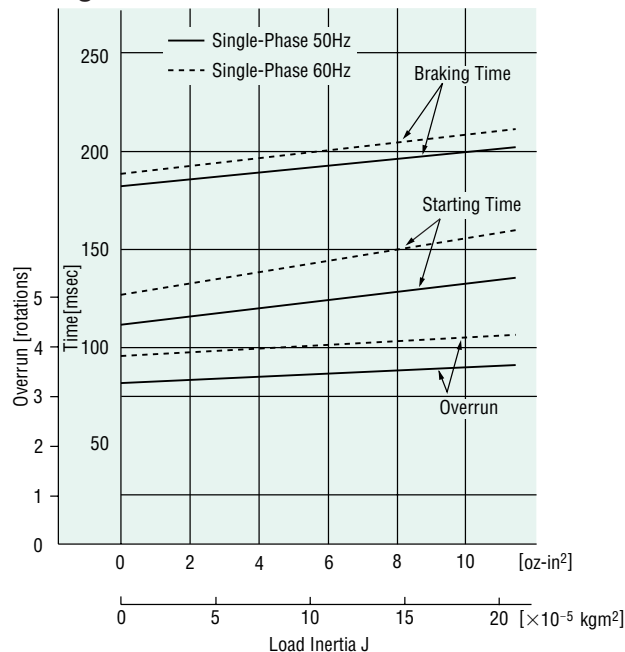
● Replace the safety cover after installing the load shaft.

Note:

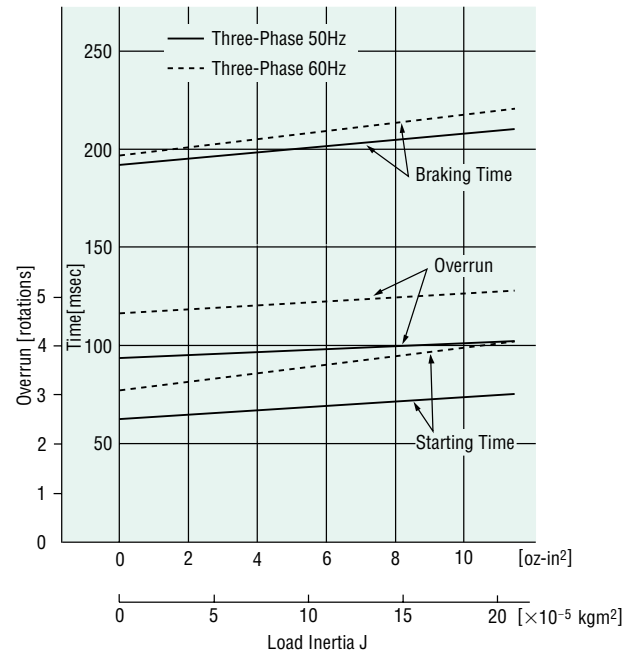
● Be careful not to apply a shock to the hollow shaft when mounting a load. It may damage the bearing inside the gearhead.

■ Starting and Braking Characteristics (Reference Values)

● Single-Phase Motor



● Three-Phase Motor



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

Mounting screws are included with the combination type parallel shaft. → A-223

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

◆ Combination Type Right-Angle Shaft, Hollow Shaft

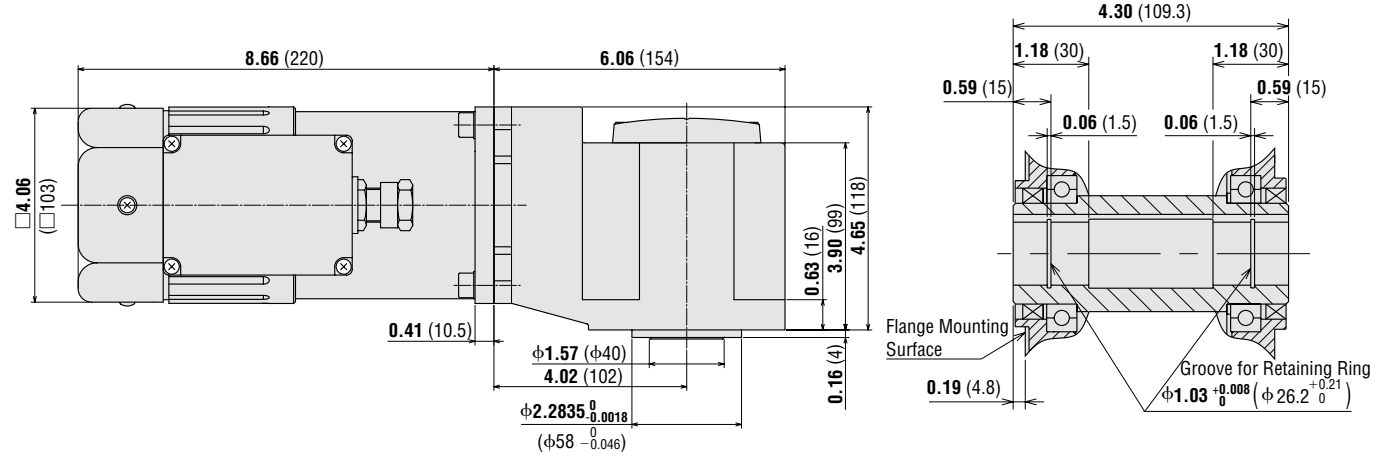
BHI62FMT-□RH, BHI62EMT-□RH, BHI62SMT-□RH

Weight: 25 lb. (11.5 kg) including gearhead

Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2

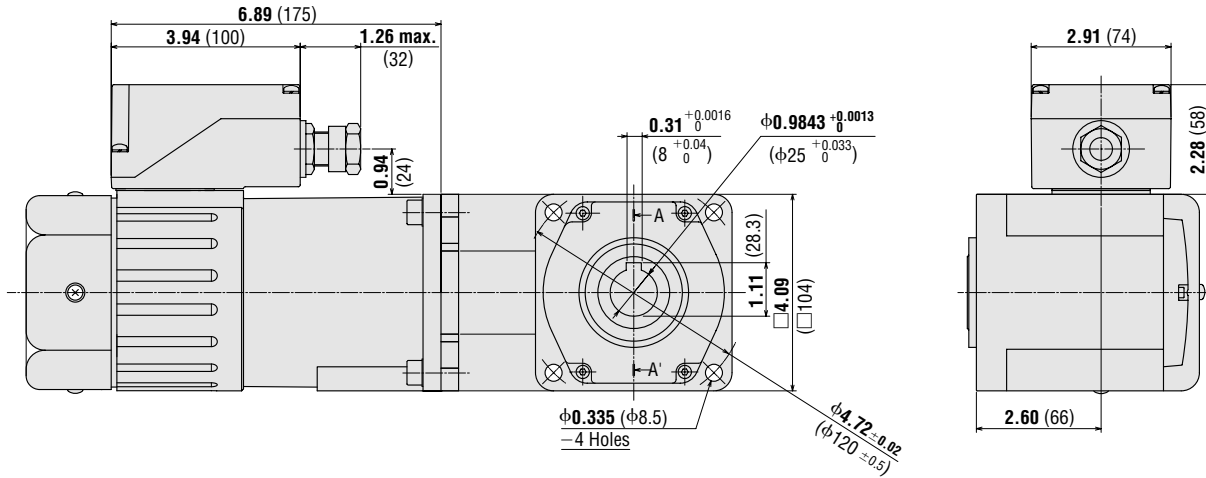
Gearhead Model: BH6G2-□RH

DXF A384



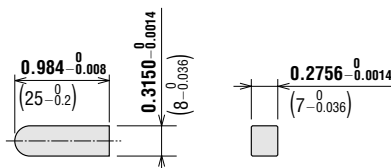
Section AA'
(Detail drawing of output shaft)

- Use cable (VCTF) with a diameter of $\phi 0.31$ inch ($\phi 8$ mm) ~ $\phi 0.47$ inch ($\phi 12$ mm)
- Details of Terminal Box → Page A-224



- Use cable (VCTF) with a diameter of $\phi 0.31$ inch ($\phi 8$ mm) ~ $\phi 0.47$ inch ($\phi 12$ mm)
- Details of Terminal Box → Page A-224

● Key (Included) (Scale 1/2)



◆ Combination Type Right-Angle Shaft, Solid Shaft

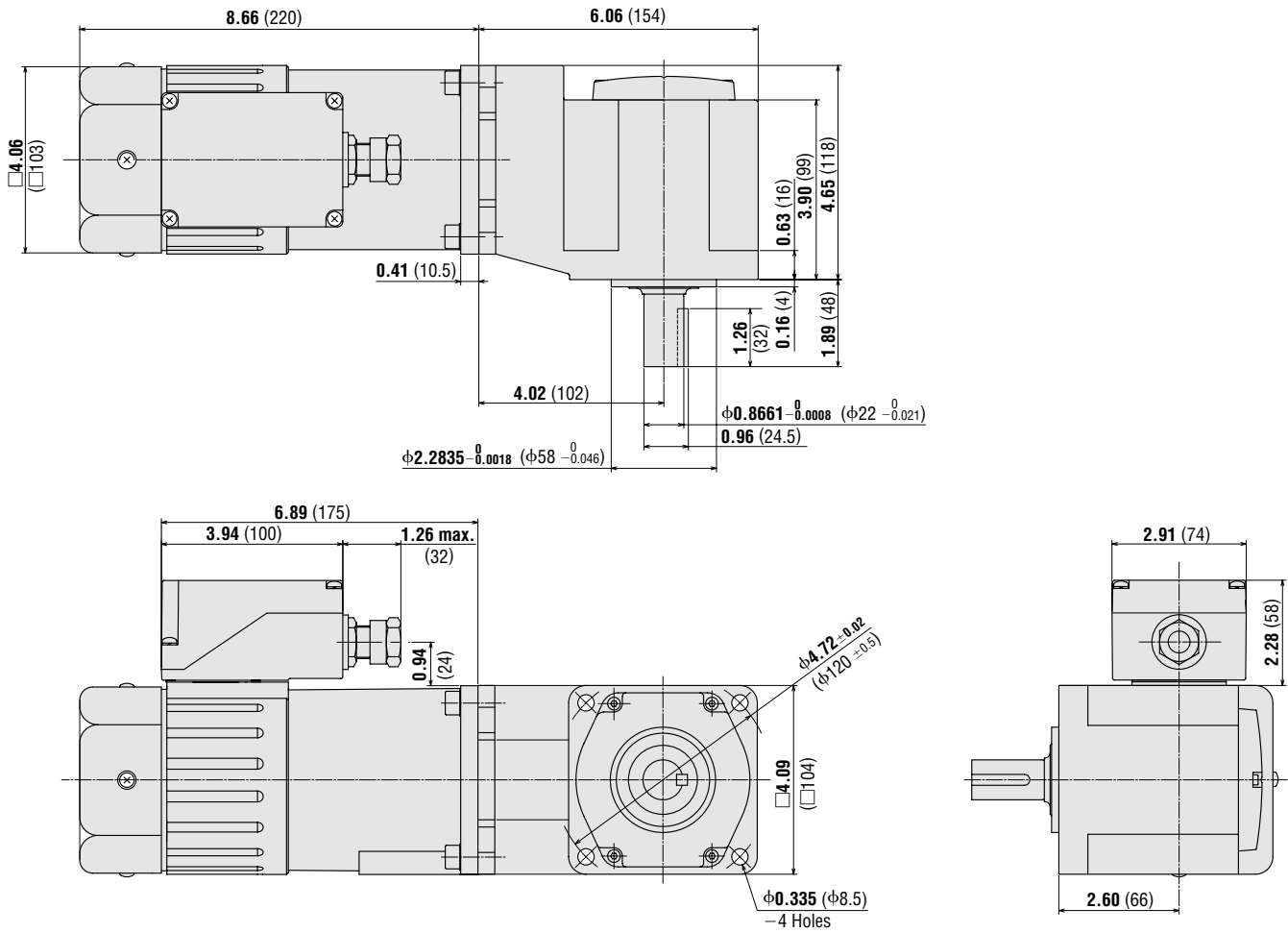
BHI62FMT-□RA, BHI62EMT-□RA, BHI62SMT-□RA

Weight: 25 lb. (11.5 kg) including gearhead

Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2

Gearhead Model: BH6G2-□RA

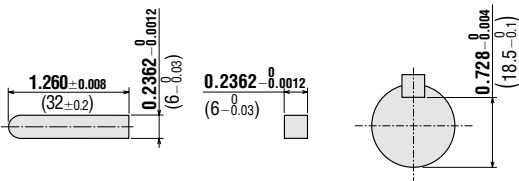
DXF A385



- Use cable (VCTF) with a diameter of $\phi 0.31$ inch ($\phi 8$ mm) ~ $\phi 0.47$ inch ($\phi 12$ mm)
- Details of Terminal Box → Page A-224

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

*At the time of shipment, a parallel key is inserted on the gearhead's shaft.



Introduction

Induction Motors

Reversible Motors

Synchronous Motors

Torque Motors

Waterlight Motors

Magnetic Brake

Clutch & Brake

Brake Pack

Right-Angle Gearheads

Accessories

Before Using a Standard AC Motor

◆ **Combination Type Parallel Shaft**

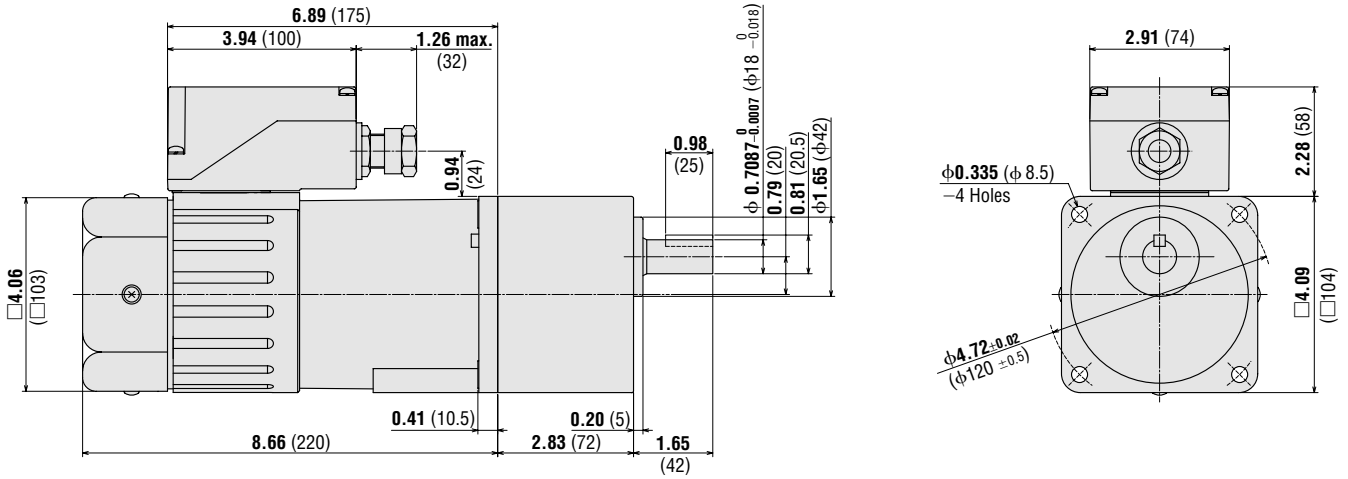
BHI62FMT-□, BHI62EMT-□, BHI62SMT-□

Weight: 21 lb. (9.5 kg)

Motor Model: BHI62FMT-G2, BHI62EMT-G2, BHI62SMT-G2

Gearhead Model: BH6G2-□

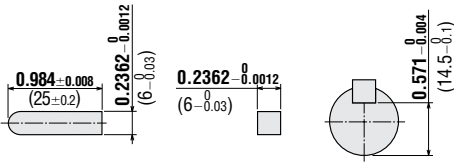
DXF A386



- Use cable (VCTF) with a diameter of $\phi 0.31$ inch ($\phi 8$ mm) ~ $\phi 0.47$ inch ($\phi 12$ mm)
- Details of Terminal Box → Page A-224

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

*At the time of shipment, a parallel key is inserted on the gearhead's shaft.

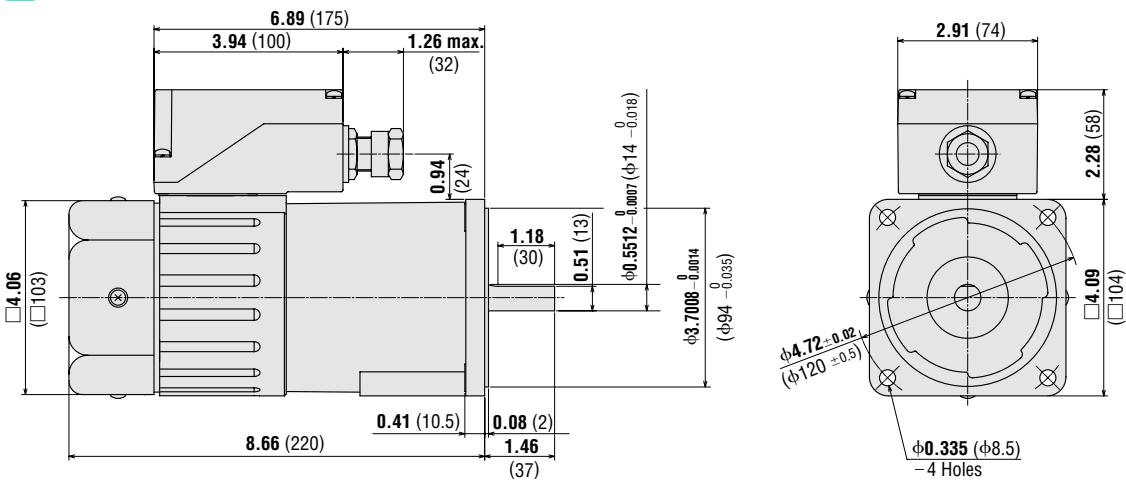


◆ **Round Shaft**

BHI62FMT-A, BHI62EMT-A, BHI62SMT-A

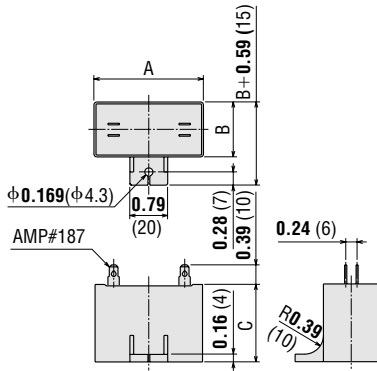
Weight: 14 lb. (6.5 kg)

DXF A387



- Use cable (VCTF) with a diameter of $\phi 0.31$ inch ($\phi 8$ mm) ~ $\phi 0.47$ inch ($\phi 12$ mm)
- Details of Terminal Box → Page A-224

◆ **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 220 VAC Input Single-Phase 230 VAC Input	Three-Phase 200/220/230 VAC Input	
SW1	125 VAC 5 A minimum	250 VAC 5 A minimum	250 VAC 5 A minimum (Inductive Load)	Switched Simultaneously
SW2	(Inductive Load)	(Inductive Load)	—	—

In order to protect the relay contacts, CR circuit (R₀ C₀) for surge suppression must be connected.

R₀=5~200Ω C₀=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**

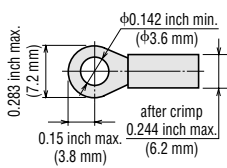
◆ **Connecting the motor**

Appropriate lead wires

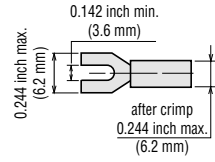
AWG 18 (0.75 mm²) min.

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

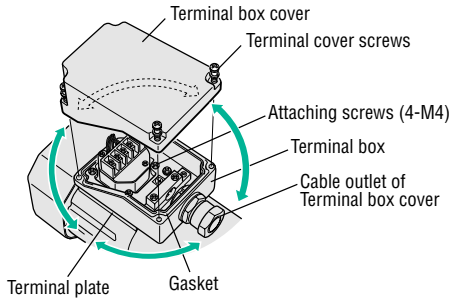
Round Terminal with Insulation



U-Shape Terminal with Insulation



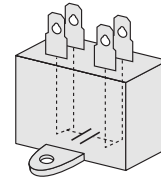
<Installing Terminal Box>



- When installing the terminal box cover, be sure to use the rubber gasket in order to maintain a tight seal.
- Cable entry is possible at any of the four sides of the terminal box. Undo the screws which fixed the terminal box to the motor case, position the terminal box so that the outlet faces in the desired direction and refasten the screws.
In order to maintain a tight seal around the terminal box, a rubber sheet is used between the terminal box and terminal plate.

● **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.