MITSUBISHI ELECTRIC

General-Purpose AC Servo

MELSERVO

MODEL

Servo Motor

INSTRUCTION MANUAL

L

● Safety Instructions ●

(Always read these instructions before using the equipment.)

Do not attempt to install, operate, maintain or inspect the servo amplifier and servo motor until you have read through this Instruction Manual, MELSERVO Servo Amplifier Installation Guide/Instruction Manual and appended documents carefully and can use the equipment correctly. Do not use the servo amplifier and servo motor until you have a full knowledge of the equipment, safety information and instructions.

In this Instruction Manual, the safety instruction levels are classified into "WARNING" and "CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight injury to personnel or may cause physical damage.

Note that the CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.

What must not be done and what must be done are indicated by the following diagrammatic symbols.

⃠ : Indicates what must not be done. For example, "No Fire" is indicated by ⃠.

● : Indicates what must be done. For example, grounding is indicated by ⏚.

In this Instruction Manual, instructions at a lower level than the above, instructions for other functions, and so on are classified into "POINT".

After reading this installation guide, always keep it accessible to the operator.

1. To prevent electric shock, note the following

⚠WARNING

- Before wiring or inspection, turn off the power and wait for 15 minutes or more until the charge lamp turns off. Then, confirm that the voltage between P and N is safe with a voltage tester and others. Otherwise, an electric shock may occur. In addition, always confirm from the front of the servo amplifier, whether the charge lamp is off or not.
- Connect the servo amplifier and servo motor to ground.
- Any person who is involved in wiring and inspection should be fully competent to do the work.
- Do not attempt to wire the servo amplifier and servo motor until they have been installed. Otherwise, you may get an electric shock.
- Operate the switches with dry hand to prevent an electric shock.
- The cables should not be damaged, stressed loaded, or pinched. Otherwise, you may get an electric shock.
- During power-on or operation, do not open the front cover of the servo amplifier. You may get an electric shock.
- Do not operate the servo amplifier with the front cover removed. High-voltage terminals and charging area are exposed and you may get an electric shock.
- Except for wiring or periodic inspection, do not remove the front cover of the servo amplifier even if the power is off. The servo amplifier is charged and you may get an electric shock.

2. To prevent fire, note the following.

⚠ CAUTION

- Install the servo amplifier, servo motor and regenerative resistor on incombustible material. Installing them directly or close to combustibles will lead to a fire.
- Always connect a magnetic contactor (MC) between the main circuit power supply and L_1, L_2, and L_3 of the servo amplifier, and configure the wiring to be able to shut down the power supply on the side of the servo amplifier's power supply. If a magnetic contactor (MC) is not connected, continuous flow of a large current may cause a fire when the servo amplifier malfunctions.
- When a regenerative resistor is used, use an alarm signal to switch main power off. Otherwise, a regenerative transistor fault or the like may overheat the regenerative resistor, causing a fire.

3. To prevent injury, note the follow

⚠ CAUTION

- Only the voltage specified in the Instruction Manual should be applied to each terminal, Otherwise, a burst, damage, etc. may occur.
- Connect the terminals correctly to prevent a burst, damage, etc.
- Ensure that polarity (+, −) is correct. Otherwise, a burst, damage, etc. may occur.
- Take safety measures, e.g. provide covers, to prevent accidental contact of hands and parts (cables, etc.) with the servo amplifier heat sink, regenerative resistor, servo motor, etc. since they may be hot while power is on or for some time after power-off. Their temperatures may be high and you may get burnt or a parts may damaged.
- During operation, never touch the rotating parts of the servo motor. Doing so can cause injury.

4. Additional instructions

The following instructions should also be fully noted. Incorrect handling may cause a fault, injury, electric shock, etc.

(1) Transportation and installation

⚠ CAUTION

- Transport the products correctly according to their weights.
- Use the eye-bolt of the servo motor to only transport the servo motor and do not use it to transport in the condition to have installed a servo motor on the machine.
- Stacking in excess of the specified number of products is not allowed.
- Do not carry the servo motor by the cables, shaft or encoder.
- Do not hold the front cover to transport the servo amplifier. The servo amplifier may drop.
- Install the servo amplifier in a load-bearing place in accordance with the Instruction Manual.
- Do not climb or stand on servo equipment. Do not put heavy objects on equipment.
- The servo motor must be installed in the specified direction.
- Leave specified clearances between the servo amplifier and control enclosure walls or other equipment.
- Do not install or operate the servo motor which has been damaged or has any parts missing.
- Do not block the intake/exhaust port of the servo motor which has a cooling fan.
- Provide adequate protection to prevent screws and other conductive matter, oil and other combustible matter from entering the servo amplifier and servo motor.
- Do not drop or strike servo motor. Isolate from all impact loads.
- When you keep or use it, please fulfill the following environmental conditions.

Environment			Conditions		
Ambient temperature	In Operation	[℃]	0 to +40 (non-freezing)		
		[℉]	32 to 104 (non-freezing)		
	In Storage	[℃]	−15 to 70 (non-freezing)		
		[℉]	5 to 158 (non-freezing)		
Ambient humidity	In Operation		80%RH or less (non-condensing)		
	In Storage		90%RH or less (non-condensing)		
Ambience			Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt		
Altitude			Max. 1000m (3280 ft) above sea level		
(Note) Vibration		[m/s^2]	HC-KFS series HC-MFS series	HC-UFS13 to 73	X,Y:49
			HC-SFS81 HC-SFS52 to 152 HC-SFS53 to 153	HC-SFS524 to 1524 HC-RFS series HC-UFS72 • 152	X,Y:24.5
			HC-SFS121 • 201 HC-SFS202 • 352 HC-SFS203 • 353	HC-SFS2024 • 3524 HC-UFS202 to 502	X:24.5 Y:49
			HC-SFS301 HC-SFS502 • 702	HC-SFS5024 • 7024	X:24.5 Y:29.4
			HC-AQ series HC-KF series HC-MF series	HA-FF series HC-UF13 to 73	X,Y:19.6
			HC-SF81 HC-SF52 to 152 HC-SF53 to 153	HC-RF series HC-UF72 • 152 HC-LFS52 to 152	X:9.8 Y:24.5
			HC-SF121 • 201 HC-SF202 • 352 HC-SF203 • 353	HC-UF202 to 502 HC-LFS202 • 302	X:19.6 Y:49
			HA-LFS601 to 12K1 HA-LFS701M to 15K1M HA-LFS502 to 22K2 HA-LFS6014 to 12K14 HA-LFS701M4 to 15K1M4 HA-LFS11K24 to 22K24	HA-LH11K2 to 22K2 HC-SF301 HC-SF502 • 702	X:11.7 Y:29.4
			HA-LFS15K1 to 37K1 HA-LFS22K1M to 37K1M HA-LFS30K2 • 37K2 HA-LFS15K14 to 37K14 HA-LFS22K1M4 to 50K1M4 HA-LFS30K24 to 55K24	HA-LF series	X,Y:9.8
		[ft/s^2]	HC-KFS series HC-MFS series	HC-UFS13 to 73	X,Y:161
			HC-SFS81 HC-SFS52 to 152 HC-SFS53 to 153	HC-SFS524 to 1524 HC-RFS series HC-UFS72 • 152	X,Y:80
			HC-SFS121 • 201 HC-SFS202 • 352 HC-SFS203 • 353	HC-SFS2024 • 3524 HC-UFS202 to 502	X:80 Y:161

⚠ CAUTION

Environment		Conditions		
(Note) Vibration	[ft/s^2]	HC-SFS301 HC-SFS502 • 702	HC-SFS5024 • 7024	X:80 Y:96
		HC-AQ series HC-KF series HC-MF series	HA-FF series HC-UF13 to 73	X,Y:64
		HC-SF81 HC-SF52 to 152 HC-SF53 to 153	HC-RF series HC-UF72 • 152 HC-LFS52 to 152	X:32 Y:80
		HC-SF121 • 201 HC-SF202 • 352 HC-SF203 • 353	HC-UF202 to 502 HC-LFS202 • 302	X:64 Y:161
		HA-LFS601 to 12K1 HA-LFS701M to 15K1M HA-LFS502 to 22K2 HA-LFS6014 to 12K14 HA-LFS701M4 to 15K1M4 HA-LFS11K24 to 22K24	HA-LH11K2 to 22K2 HC-SF301 HC-SF502 • 702	X:38.4 Y:96.5
		HA-LFS15K1 to 37K1 HA-LFS22K1M to 37K1M HA-LFS30K2 • 37K2 HA-LFS15K14 to 37K14 HA-LFS22K1M4 to 50K1M4 HA-LFS30K24 to 55K24	HA-LF series	X,Y:32

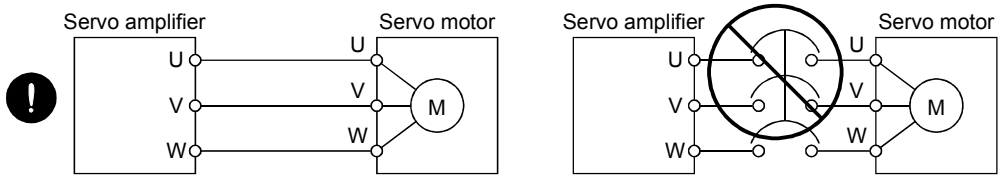
Note. Except the servo motor with reduction gear.

- Securely attach the servo motor to the machine. If attach insecurely, the servo motor may come off during operation.
- The servo motor with reduction gear must be installed in the specified direction to prevent oil leakage.
- Take safety measures, e.g. provide covers, to prevent accidental access to the rotating parts of the servo motor during operation.
- Never hit the servo motor or shaft, especially when coupling the servo motor to the machine. The encoder may become faulty.
- Do not subject the servo motor shaft to more than the permissible load. Otherwise, the shaft may break.

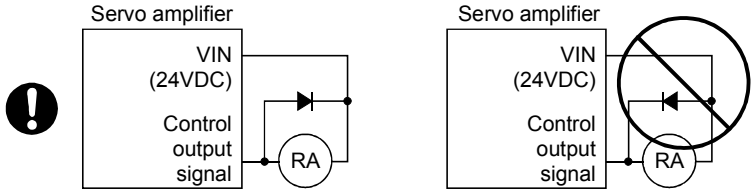
(2) Wiring

⚠ CAUTION

- Wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly.
- Do not install a power capacitor, surge absorber or radio noise filter (FR-BIF option) between the servo motor and servo amplifier.
- Connect the output terminals (U, V, W) correctly. Otherwise, the servo motor will operate improperly.
- Connect the servo motor power terminal (U, V, W) to the servo motor power input terminal (U, V, W) directly. Do not let a magnetic contactor, etc. intervene.



- Do not connect AC power directly to the servo motor. Otherwise, a fault may occur.
- The surge absorbing diode installed on the DC output signal of the servo amplifier relay must be wired in the specified direction. Otherwise, the forced stop and other protective circuits may not operate.



- When the cable is not tightened enough to the terminal block (connector), the cable or terminal block (connector) may generate heat because of the poor contact. Be sure to tighten the cable with specified torque.

(3) Test run adjustment

⚠ CAUTION

- Before operation, check the parameter settings. Improper settings may cause some machines to perform unexpected operation.
- The parameter settings must not be changed excessively. Operation will be insatiable.

(4) Usage

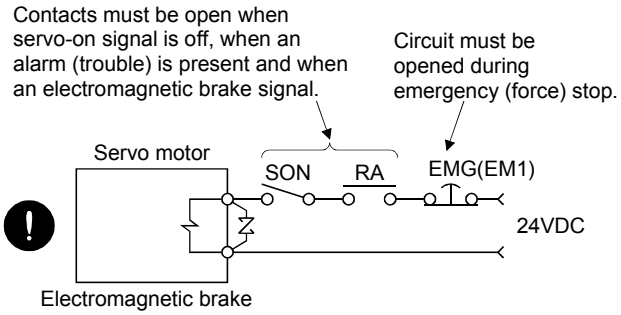
⚠ CAUTION

- Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.
- Any person who is involved in disassembly and repair should be fully competent to do the work.
- The STOP key of the parameter unit is only valid for test run. Provide an emergency stop key independently of the STOP key. (MELSERVO-H series only)
- Before resetting an alarm, make sure that the run signal into the servo amplifier is off to prevent an accident. A sudden restart is made if an alarm is reset with the run signal on.
- Do not modify the equipment.
- Use a noise filter, etc. to minimize the influence of electromagnetic interference, which may be caused by electronic equipment used near the servo amplifier.
- Burning or breaking a servo amplifier may cause a toxic gas. Do not burn or break a servo amplifier.
- Use the servo amplifier with the specified servo motor.
- The electromagnetic brake on the servo motor is designed to hold the servo motor shaft and should not be used for ordinary braking.
- For such reasons as service life and mechanical structure (e.g. where a ball screw and the servo motor are coupled via a timing belt), the electromagnetic brake may not hold the servo motor shaft. To ensure safety, install a stopper on the machine side.

(5) Corrective actions

⚠ CAUTION

- When it is assumed that a hazardous condition may take place at the occur due to a power failure or a product fault, use a servo motor with electromagnetic brake or an external brake mechanism for the purpose of prevention.
- Configure the electromagnetic brake circuit so that it is activated not only by the servo amplifier signals but also by an external emergency (forced) stop signal.



- When any alarm has occurred, eliminate its cause, ensure safety, and deactivate the alarm before restarting operation.
- When power is restored after an instantaneous power failure, keep away from the machine because the machine may be restarted suddenly (design the machine so that it is secured against hazard if restarted).

(6) Maintenance, inspection and parts replacement

⚠ CAUTION

- With age, the electrolytic capacitor of the servo amplifier will deteriorate. To prevent a secondary accident due to a fault, it is recommended to replace the electrolytic capacitor every 10 years when used in general environment.
  Please consult our sales representative.

(7) Storage

⚠ CAUTION

Note the following points when storing the servo motor for an extended period of time (guideline: three or more months).

- Always store the servo motor indoors in a clean and dry place.
- If it is stored in a dusty or damp place, make adequate provision, e.g. cover the whole product.
- If the insulation resistance of the winding decreases, reexamine the storage method.
- Though the servo motor is rust-proofed before shipment using paint or rust prevention oil, rust may be produced depending on the storage conditions or storage period.
  If the servo motor is to be stored for longer than six months, apply rust prevention oil again especially to the machined surfaces of the shaft, etc.
- Before using the product after storage for an extended period of time, hand-turn the motor output shaft to confirm that nothing is wrong with the servo motor. (When the servo motor is equipped with a brake, make the above check after releasing the brake with the brake power supply.)
- When the equipment has been stored for an extended period of time, consult Mitsubishi.

(8) General instruction

⚠ CAUTION

- To illustrate details, the equipment in the diagrams of this Instruction Manual may have been drawn without covers and safety guards. When the equipment is operated, the covers and safety guards must be installed as specified. Operation must be performed in accordance with this Instruction Manual.

● About processing of waste ●

When you discard servo amplifier, a battery (primary battery), and other option articles, please follow the law of each country (area).

⚠ FOR MAXIMUM SAFETY

- These products have been manufactured as a general-purpose part for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine, passenger movement vehicles or under water relays, contact Mitsubishi.
- These products have been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

⚠ EEP-ROM life

The number of write times to the EEP-ROM, which stores parameter settings, etc., is limited to 100,000. If the total number of the following operations exceeds 100,000, the servo amplifier and/or converter unit may fail when the EEP-ROM reaches the end of its useful life.

- Write to the EEP-ROM due to parameter setting changes
- Write to the EEP-ROM due to device changes

Precautions for Choosing the Products

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

COMPLIANCE WITH EC DIRECTIVES

1. WHAT ARE EC DIRECTIVES?

The EC Directives were issued to standardize the regulations of the EU countries and ensure smooth distribution of safety-guaranteed products. In the EU countries, the Machinery Directive (effective in January, 1995), EMC Directive (effective in January, 1996) and Low Voltage Directive (effective in January, 1997) of the EC Directives require that products to be sold should meet their fundamental safety requirements and carry the CE marks (CE marking). CE marking applies to machines and equipment into which servo amplifiers have been installed.

The servo amplifiers do not function independently but are designed for use with machines and equipment.

Therefore, the CE marking does not apply to the servo amplifiers but applies to the machines and equipment into which the servo amplifiers are installed.

This servo amplifier conforms to the standards related to the Low Voltage Directive to facilitate CE marking on machines and equipment into which the servo amplifiers will be installed. To ensure ease of compliance with the EMC Directive, Mitsubishi Electric prepared the "EMC INSTALLATION GUIDELINES" (IB(NA)67310) which provides servo amplifier installation, control box making and other procedures. Please contact your sales representative.

2. PRECAUTIONS FOR COMPLIANCE

Use the servo motor compatible with the EN Standard.
Unless otherwise specified, the handling, performance, specifications and others of the EN Standard-compatible models are the same as those of the standard models.
To comply with the EN Standard, also observe the following items strictly.

(1) Wiring

(a) Use a fixed terminal block to connect the power supply lead of the servo motor to the servo amplifier. Do not connect cables directly.

Terminal block

(b) Use the servo motor side power connector which complies with the EN Standard.
The EN Standard-compliant power connector sets are available from us as options.

Power Connector Set Model	Servo Motor Model
MR-PWCNF	HC-FF□C(B)-UE
MR-PWCNS1	HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B) • 152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B) • 152(B) HC-LFS52(B) to 152(B)
MR-PWCNS2	HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B) • 353(B) HC-RF353(B) • 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B) • 353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B) • 503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B) • 302(B)
MR-PWCNS3	HC-SF702(B) • HC-SFS702(B) HC-SFS7024(B) HA-LFS702

(2) Installation

The flange of the machine mounted with the HC-MF(HC-MF-UE)/HC-KF(HC-KF-UE)/HC-AQ/HC-MFS/HC-KFS must be connected to the earth (⏚).

(3) Performing EMC tests

When EMC tests are run on a machine/device into which the servo motor has been installed, it must conform to the electromagnetic compatibility (immunity/emission) standards after it has satisfied the operating environment/electrical equipment specifications.

For the other EMC directive guidelines on the servo motor, refer to the EMC Installation Guidelines (IB(NA)67310).

CONFORMANCE WITH UL/C-UL STANDARD

Use the UL/C-UL Standard-compliant model of servo motor.
Unless otherwise specified, the handling, performance, specifications, etc. of the UL/C-UL Standard-compliant models are the same as those of the standard models.
The servo motor is compliant with the UL/C-UL standard when it is mounted on the flanges made of aluminum whose sizes are indicated in the following table.
The rated torque of the servo motor under the UL/C-UL standard indicates the continuous permissible torque value that can be generated when it is mounted on the flange specified in this table and used in the environment of 0℃ to 40℃ ambient temperature. Therefore, to conform to the UL/C-UL standard, mount the servo motor on a flange with a heat radiating effect equivalent to that of this flange.

Flange Size [mm]	Servo Motor								
	HC-KF(-UE) HC-KFS	HC-MF(-UE) HC-MFS	HA-FF□C -UE	(Note 2) HC-SF HC-SFS	HC-RF HC-RFS	HC-UF HC-UFS	HA-LF HA-LFS	HC-LFS	HC-AQ
150 × 150 × 3									0135 to 0335
150 × 150 × 6	053・13	053・13	053・13			13			
250 × 250 × 6	23	23	23・33			23			
250 × 250 × 12	43	43	43・63	81 52 to 152 53 to 153 524 to 1524	103 to 203	43		52 to 152	
300 × 300 × 12	(Note 1) 73	73				73			
300 ×300 × 20				121・201 202・352 203・353 2024・3524				202・302	
550 × 550 × 30					353・503	72・152			
650 × 650 × 35				301 502・702 5024・7024		202 to 502	601 to 12K1 701M to 15K1M 502 to 22K2 6014 to 12K14 701M4 to 15K1M4 11K24 to 22K24		
950 × 950 × 35							15K1 to 37K1 22K1M to 37K1M 30K2・37K2 15K14 to 37K14 22K1M4 to 50K1M4 30K24 to 55K24		

Note 1. 73 is not available for the HC-KF(-UE) series.
2. 524 to 7024 are not available for the HC-SF series.

CONTENTS

MEMO

1. INTRODUCTION

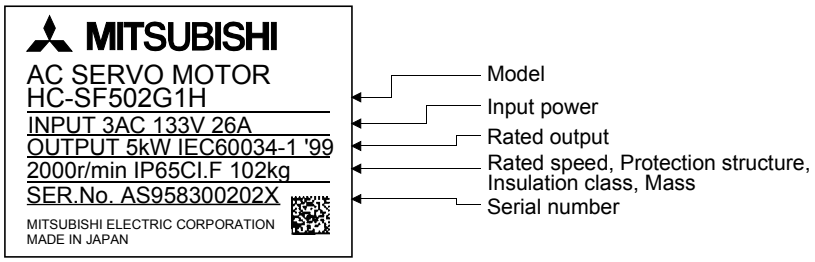
1.1 Servo motor features

Servo Motor Series	Features (Points Different from Conventional Products)	Rated Speed [r/min]	Positioning Resolution [pulses/rev]	Capacity [kW]	Interchangeable Servo Motor Series	Compliance with Overseas Standards	Environmental Resistance
HC-KF	Low inertia, small capacity 4 to 5 times greater in inertia moment than HC-MF(S). Equipped with absolute position detector as standard	3000	8192	0.05 to 0.4	HC-MF HC-ME HC-MH	EN Standard UL/C-UL Standard (Standard model is compliant)	(Note1 • 2) IP44
HC-KFS			131072				(Note1 • 2) IP55
HC-MF	Ultra low inertia, small capacity 1.2 times higher in power rate than HA-ME Equipped with absolute position detector as standard	3000	8192	0.05 to 0.75	HA-ME HA-MH	EN Standard UL/C-UL Standard (Standard model is compliant)	(Note1 • 2) IP44
HC-MFS			131072				(Note1 • 2) IP55
HA-FF	Low inertia, small capacity Equipped with absolute position detector as standard	8192	3000	0.05 to 0.6	HA-FE HA-FH	EN Standard UL/C-UL Standard (HA-FF-UE is compliant)	(Note1 • 2) IP44
HC-SF	Middle inertia, middle capacity 1.5 times higher in power rate than HA-SE Equipped with absolute position detector as standard	1000 2000 3000	16384	0.5 to 7	HA-SE HA-SH	EN Standard UL/C-UL (Standard model is compliant)	IP65
HC-SFS	Three-phase, 200VAC-compatible Middle inertia, middle capacity 1.5 times higher in power rate than HA-SE Equipped with absolute position detector as standard	1000 2000 3000	131072	0.5 to 7	HA-SE HA-SH	EN Standard UL/C-UL (Standard model is compliant)	IP65
	Three-phase, 400VAC-compatible Middle inertia, middle capacity Equipped with absolute position detector as standard	2000					
HC-RF	Ultra low inertia, middle capacity About 3 times higher in power rate than HA-LH Equipped with absolute position detector as standard	3000	16384	1 to 5		EN Standard UL/C-UL Standard (Standard model is compliant)	IP65
HC-RFS			131072				
HC-UF	Flat type, small capacity Equipped with absolute position detector as standard	3000	8192	0.1 to 0.75		EN Standard UL/C-UL Standard (Standard model is compliant)	(Note1) IP65
	Flat type, middle capacity Equipped with absolute position detector as standard	2000	16384	0.75 to 5			IP65
HC-UFS	Flat type small capacity Equipped with absolute position detector as standard	3000	131072	0.1 to 0.75		EN Standard UL/C-UL Standard (Standard model is compliant)	(Note1) IP65
	Flat type middle capacity Equipped with absolute position detector as standard	2000		0.75 to 5			IP65
HA-LH	Low inertia, large capacity	2000	16384	11 to 22		EN Standard (HA-LH-EC is compliant)	JP44
HC-AQ	24VDC-compatible, compact size, small capacity	3000	8192	0.01 to 0.03		EN Standard, UL/C-UL Standard (Standard model is compliant)	(Note1 • 2) IP55
HA-LF	Three-phase, 200VAC-compatible, low inertia, large capacity Equipped with absolute position detector as standard	2000	16384	30 • 37			IP44
	Three-phase, 400VAC-compatible, low inertia, large capacity Equipped with absolute position detector as standard			30 to 55			
HA-LFS	Three-phase, 200VAC-compatible, low inertia, middle large capacity Equipped with absolute position detector as standard	1000	131072	6 to 37		EN Standard, UL/C-UL Standard (Standard model is compliant)	IP44
		1500		7 to 37			
		2000		5 to 37	HA-LH		
	Three-phase, 400VAC-compatible, low inertia, large capacity Equipped with absolute position detector as standard	1000		6 to 37			
		1500		7 to 50			
		2000		11 to 55			
HC-LFS	Low inertia, middle capacity Equipped with absolute position detector as standard	2000	131072	0.5 to 3	HA-LH	EN Standard, UL/C-UL Standard (Standard model is compliant)	IP65

Note 1. Except connector section.
2. Except for the shaft-through portion.

1.2 Model name make-up

(1) Rating plate



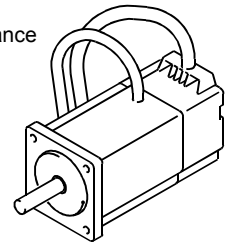
(2) Model

(a) HC-MF series (ultra low inertia, small capacity)

HC-MF □ 3 □ □ □ □

Series name

Appearance



Compliance with Standard

Symbol	Specifications
None	(Note) Standard model (EN•UL/C-UL Standard)
-UE	EN • UL/C-UL Standard

Note. The standard models produced in and after February, 2001 are compatible with the EN•UL/C-UL Standard.

Shaft type

Symbol	Shaft Shape	HC-MF□
None	Standard (Straight shaft)	053 to 73
(Note) K	With keyway (With key)	23 to 73
(Note) D	D-cut shaft	53•13

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	For general industrial machine
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000 [r/min]

Rated output

Symbol	Rated Output [kW]
05	0.05
1	0.1
2	0.2
4	0.4
7	0.75

(b) HA-FF series (low inertia, small capacity)

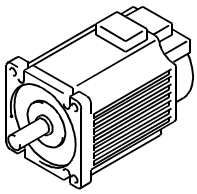
HA-FF □ 3 □ □ □ □ □

Series name

Compliance with Standard

Symbol	Specifications
None	Standard model (Japan)
-UE	EN • UL/C-UL Standard

Appearance



Shaft type

Symbol	Shaft Shape	HA-FF□
None	(Note1) Standard	053 to 63
(Note2) D	D-cut shaft	053 • 13

Note 1. The Standard shafts of the HA-FF23 to 63 are with keys and those of the other models are straight shafts.
2. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	For general industrial machine
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Input power supply form

Symbol	Standard model	EN •UL/C-UL Standard-compliant model
None	Lead	
C		Cannon connector

Rated speed
3000 [r/min]

Rated output

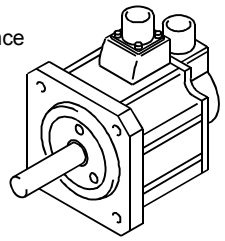
Symbol	Rated Output [kW]	Symbol	Rated Output [kW]
05	0.05	3	0.3
1	0.1	4	0.4
2	0.2	6	0.6

(c) HC-SF series (middle inertia, middle capacity)

HC-SF □ □ □ □ □

Series name

Appearance



Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (With key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	(Note) Reduction Gear
None	Without
G1	For general industrial machine (flange type)
G1H	For general industrial machine (leg type)
G2	For precision application

Note. Not provided for 1000r/min and 3000r/min series.

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed

Symbol	Speed [r/min]
1	1000
2	2000
3	3000

Rated output

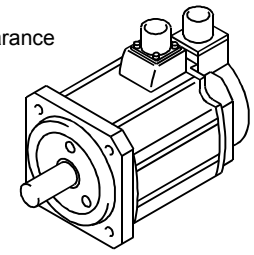
Symbol	Rated Output [kW]	1000 [r/min]	2000 [r/min]	3000 [r/min]
5	0.5		○	
8	0.85	○		
10	1		○	○
12	1.2	○		
15	1.5		○	○
20	2	○	○	○
30	3	○		
35	3.5		○	○
50	5		○	
70	7		○	

(d) HC-RF series (ultra low inertia, middle capacity)

HC-RF □ 3 □ □ □

Series name

Appearance



Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (With key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000 [r/min]

Rated output

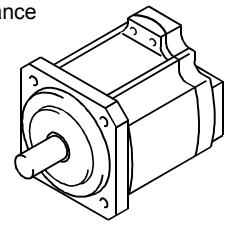
Symbol	Rated Output [kW]
10	1
15	1.5
20	2
35	3.5
50	5

(e) HC-UF series (flat type, small and middle capacity)

HC-UF □ □ □ □

Series name

Appearance



Shaft type

Symbol	Shaft Shape	HC-UF□
None	Standard (Straight shaft)	13 to 43 72 to 202
(Note) K	With keyway (HC-UF23 to 73: With key)	
(Note) D	D-cut shaft	13

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed

Symbol	Speed [r/min]
2	2000
3	3000

Rated output

Symbol	Rated Output [kW]
1	0.1
2	0.2
4	0.4
7	0.75
15	1.5
20	2
35	3.5
50	5

(f) HA-LH series (low inertia, large capacity)

HA-LH □ 2 □ □

Series name

Compliant Standard

Symbol	Specifications
None	Standard model (in Japan)
-EC	EN Standard

Encoder

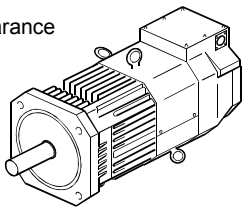
Symbol	Encoder
None	Incremental
-Y	Absolute

Rated speed
2000[r/min]

Rated output

Symbol	Rated Output [kW]
11K	11
15K	15
22K	22

Appearance



(g) HC-KF series (low inertia, small capacity)

HC-KF □ □ 3 □ □ □

Series name

Compliance with Standard

Symbol	Specifications
None	(Note) Standard model (EN•UL/C-UL Standard)
-UE	EN•UL/C-UL Standard

Note. The standard models produced in and after February, 2001 are compatible with the EN•UL/C-UL Standard.

Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	For general industrial machine
G2	For precision application

Electromagnetic brake

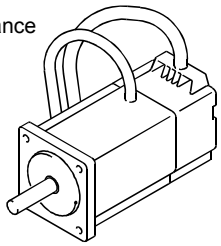
Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000[r/min]

Rated output

Symbol	Rated Output [kW]
05	0.05
1	0.1
2	0.2
4	0.4

Appearance



(h) HC-AQ series (24VDC-compatible, compact size, small capacity)

HC-AQ □ 3 5 □ □

Series name

Shaft type

Symbol	Shaft Shape
(Note) D	D-cut shaft
(Note) S	Straight shaft

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

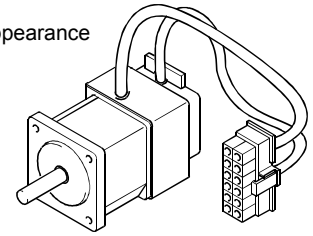
Power supply voltage
24VDC

Rated speed
3000 [r/min]

Rated output

Symbol	Rated Output [kW]
01	0.01
02	0.02
03	0.03

Appearance



(i) HA-LF series (Three-phase, 200 • 400VAC-compatible, low inertia, large capacity)

HA-LF □ 2 □

Series name

Power supply specification

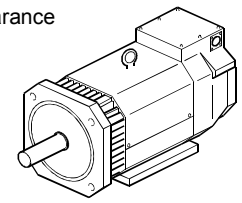
Symbol	Power Supply Voltage
None	Three-phase 200 to 230VAC
4	Three-phase 380 to 480VAC

Rated speed
2000 [r/min]

Rated output

Symbol	Rated Output [kW]	Power supply specifications	
		Three-phase 200 to 230VAC	Three-phase 380 to 480VAC
30K	30	○	○
37K	37	○	○
45K	45		○
55K	55		○

Appearance

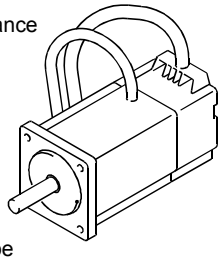


(j) HC-KFS series (low inertia, small capacity, high resolution)

HC-KFS□ 3□□□

Series name

Appearance



Shaft type

Symbol	Shaft Shape	HC-KFS□
None	Standard (Straight shaft)	053 to 73
(Note) K	With keyway (With key)	23 to 73
(Note) D	D-cut shaft	053•13

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	For general industrial machine
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000[r/min]

Rated output

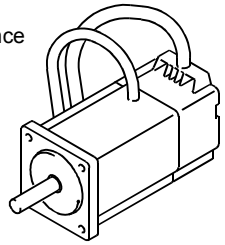
Symbol	Rated Output [kW]
05	0.05
1	0.1
2	0.2
4	0.4

(k) HC-MFS series (ultra low inertia, small capacity, high resolution)

HC-MFS□ 3□□□

Series name

Appearance



Shaft type

Symbol	Shaft Shape	HC-MFS□
None	Standard (Straight shaft)	053 to 73
(Note) K	With keyway (With key)	23 to 73
(Note) D	D-cut shaft	53•13

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	For general industrial machine
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000 [r/min]

Rated output

Symbol	Rated Output [kW]
05	0.05
1	0.1
2	0.2
4	0.4
7	0.75

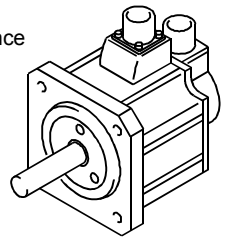
(l) HC-SFS series (middle inertia, middle capacity, high resolution)

1) 200VAC-compatible

HC-SFS □ □ □ □ □

Series name

Appearance



Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G1	(Note) For general industrial machine (flange type)
G1H	(Note) For general industrial machine (leg type)
G2	(Note) For precision application

Note. Not provided for 1000r/min and 3000r/min series.

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed

Symbol	Speed [r/min]
1	1000
2	2000
3	3000

Rated output

Symbol	Rated Output [kW]	1000 [r/min]	2000 [r/min]	3000 [r/min]
5	0.5		○	○
8	0.85	○		
10	1		○	○
12	1.2	○		
15	1.5		○	○
20	2	○	○	○
30	3	○		
35	3.5		○	○
50	5		○	
70	7		○	

2) 400VAC-compatible

HC-SFS □ 2 4 □□□

Series name

Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reductiongear

Symbol	Reductiongear
None	Without
G1	For general industrial machine (flange type)
G1H	For general industrial machine (leg type)
G2	For precision application

Electromagnetic brake

Symbol	Electromagnetic brake
None	Without
B	With

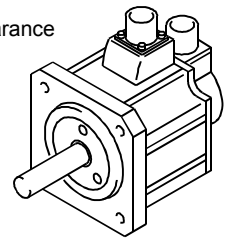
Power supply voltage
Three-phase 380 to 480 VAC

Rated speed
2000 [r/min]

Rated output

Symbol	Rated output [kW]
5	0.5
10	1
15	1.5
20	2
35	3.5
50	5
70	7

Appearance



(m) HC-RFS series (ultra low inertia, middle capacity, high resolution)

HC-RFS □ 3 □ □ □

Series name

Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Reduction gear

Symbol	Reduction Gear
None	Without
G2	For precision application

Electromagnetic brake

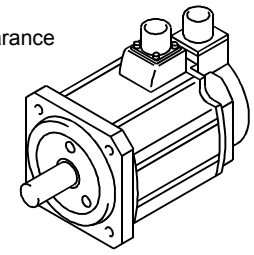
Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
3000 [r/min]

Rated output

Symbol	Rated Output [kW]
10	1
15	1.5
20	2
35	3.5
50	5

Appearance



(n) HC-UFS series (flat type small and middle capacity, high resolution)

HC-UFS □ □ □ □

Series name

Shaft type

Symbol	Shaft Shape	HC-UFS□
None	Standard (Straight shaft)	13 to 43 72 to 202
(Note) K	With keyway HC-UFS 23 to 73 are provided with keys.	
(Note) D	D-cut shaft	13

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

Symbol	Electromagnetic Brake
None	Without
B	With

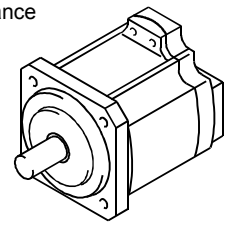
Rated speed

Symbol	Speed [r/min]
2	2000
3	3000

Rated output

Symbol	Rated Output [kW]
1	0.1
2	0.2
4	0.4
7	0.75
15	1.5
20	2
35	3.5
50	5

Appearance



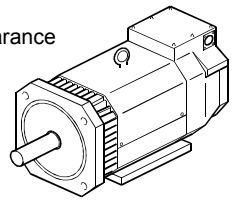
(o) HA-LFS series (low inertia, middle large capacity, high resolution)

1) 200VAC-compatible

HA-LFS □□□□

Series name

Appearance



Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

Symbol	Electromagnetic brake
Note	Without
(Note)B	For precision application

Note. Refer to Table 6.1 for the servo motor compatible with the electromagnetic brake.

Rated speed

Symbol	Speed [r/min]
1	1000
1M	1500
2	2000

Rated output

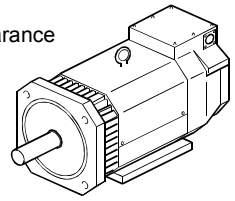
Symbol	Rated Output [kW]	1000 [r/min]	1500 [r/min]	2000 [r/min]
50	5			○
60	6	○		
70	7		○	○
80	8	○		
11K	11		○	○
12K	12	○		
15K	15	○	○	○
20K	20	○		
22K	22		○	○
25K	25	○		
30K	30	○	○	○
37K	37	○	○	○

2) 400VAC-compatible

HA-LFS □□4□□

Series name

Appearance



Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

Symbol	Electromagnetic brake
Note	Without
(Note)B	For precision application

Note. Refer to Table 6.1 for the servo motor compatible with the electromagnetic brake.

Power supply voltage
Three-phase 380 to 480 VAC

Rated speed

Symbol	Speed [r/min]
1	1000
1M	1500
2	2000

Rated output

Symbol	Rated Output [kW]	1000 [r/min]	1500 [r/min]	2000 [r/min]
60	6	○		
70	7		○	
80	8	○		
11K	11		○	○
12K	12	○		
15K	15	○	○	○
20K	20	○		
22K	22		○	○
25K	25	○		
30K	30	○	○	○
37K	37	○	○	○
45K	45		○	○
50K	50		○	
55K	55			○

(p) HC-LFS series (low inertia, middle capacity, high resolution)

HC-LFS □ 2 □□

Series name

Shaft type

Symbol	Shaft Shape
None	Standard (Straight shaft)
(Note) K	With keyway (Without key)

Note. The special shaft applies to the standard servo motor and servo motor with electromagnetic brake.

Electromagnetic brake

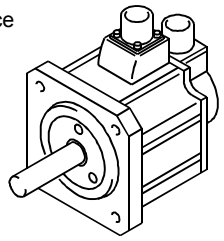
Symbol	Electromagnetic Brake
None	Without
B	With

Rated speed
2000 [r/min]

Rated output

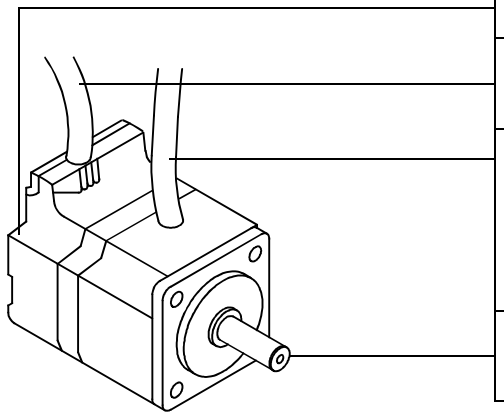
Symbol	Rated Output [kW]
5	0.5
10	1
15	1.5
20	2
30	3

Appearance



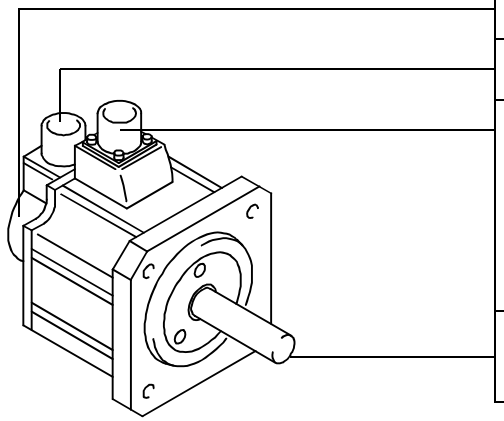
1.3 Parts identification

Lead type



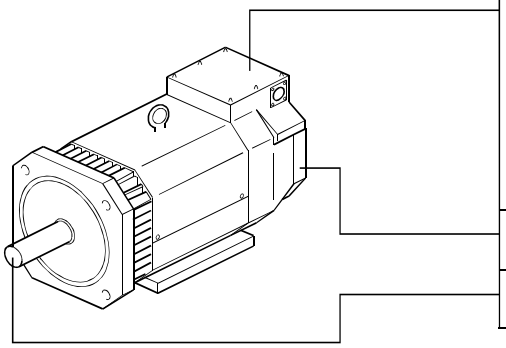
Name/Application	Reference
Encoder	Section 5.1
Encoder cable with encoder connector	Section 3.2
Power cable • Power lead (U・V・W) • Earth lead • Brake lead (for motor with electromagnetic brake)	Chapter 7
Servo motor shaft	Chapter 2 Section 5.4

Connector type



Name/Application	Reference
Encoder	Section 5.1
Encoder connector	Section 3.2
Power connector • Power supply (U・V・W) • Earth (⏚) • Brake (for motor with electromagnetic brake) Some motors with electromagnetic brakes have brake connectors separately.	Chapter 7
Servo motor shaft	Chapter 2 Section 5.4

Terminal box type



Name/Application	Reference
Terminal box • Power leads (U・V・W) • Cooling fan leads • Ground terminal • Brake lead (for motor with electromagnetic brake) • Encoder connector	Chapter 7 Section 3.2
Encoder	Section 5.1
Servo motor shaft	Chapter 2

MEMO

2. INSTALLATION

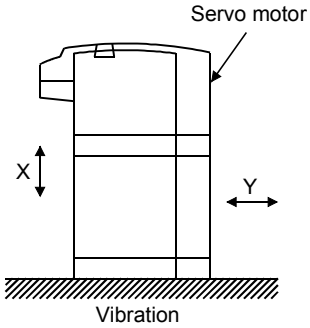
⚠ CAUTION	・Stacking in excess of the limited number of products is not allowed. ・Install the equipment on incombustible material. Installing them directly or close to combustibles will lead to a fire. ・Install the equipment in a load-bearing place in accordance with this Instruction Manual. ・Do not get on or put heavy load on the equipment to prevent injury. ・Use the equipment within the specified environmental condition range. ・Do not subject the servo motor to drop impact or shock loads as they are precision equipment. ・Do not install or operate a faulty servo amplifier. ・Do not hold the cable, shaft or encoder to carry the servo motor. Otherwise, a fault or injury may occur. ・The lifting eyebolts of the servo motor may only be used to transport the servo motor. They must not be used to transport the servo motor when it is mounted on a machine. ・The servo motor with reduction gear must be installed in the specified direction. Otherwise, it can leak oil, leading to a fire or fault. ・Securely fix the servo motor to the machine. If fixed insecurely, the servo motor will come off during operation, leading to injury. ・When coupling the shaft end of the servo motor, do not subject the shaft end to impact, such as hammering. The encoder may become faulty. ・When coupling a load to the servo motor, do not use a rigid coupling. Doing so can cause the shaft to break. ・Take safety measures, e.g. provide covers, to prevent accidental access to the rotating parts of the servo motor during operation. ・Do not subject the servo motor shaft to more than the permissible load. Otherwise, the shaft may break, leading to injury. ・When the product has been stored for an extended period of time, consult Mitsubishi. ・When treating the servo motor, be careful about the edged parts such as the corners of the servo motor.

2.1 Environmental conditions

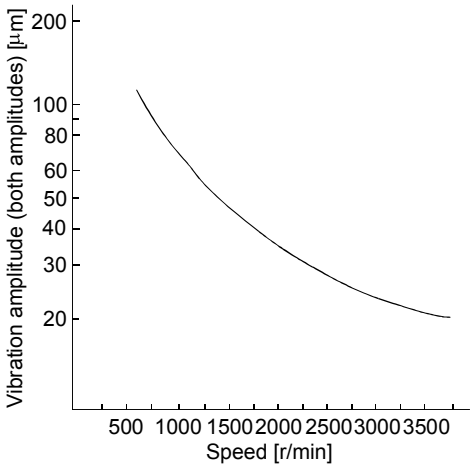
Environment			Conditions		
Ambient temperature	In Operation	[℃]	0 to +40 (non-freezing)		
		[℉]	32 to 104 (non-freezing)		
	In Storage	[℃]	−15 to 70 (non-freezing)		
		[℉]	5 to 158 (non-freezing)		
Ambient humidity	In Operation		80%RH or less (non-condensing)		
	In Storage		90%RH or less (non-condensing)		
Ambience			Indoors (no direct sunlight) Free from corrosive gas, flammable gas, oil mist, dust and dirt		
Altitude			Max. 1000m (3280 ft) above sea level		
(Note) Vibration		[m/s²]	HC-KFS series HC-MFS series	HC-UFS13 to 73	X,Y:49
			HC-SFS81 HC-SFS52 to 152 HC-SFS53 to 153	HC-SFS524 to 1524 HC-RFS series HC-UFS72 • 152	X,Y:24.5
			HC-SFS121 • 201 HC-SFS202 • 352 HC-SFS203 • 353	HC-SFS2024 • 3524 HC-UFS202 to 502	X:24.5 Y:49
			HC-SFS301 HC-SFS502 • 702	HC-SFS5024 • 7024	X:24.5 Y:29.4
			HC-AQ series HC-KF series HC-MF series	HA-FF series HC-UF13 to 73	X,Y:19.6
			HC-SF81 HC-SF52 to 152 HC-SF53 to 153	HC-RF series HC-UF72 • 152 HC-LFS52 to152	X:9.8 Y:24.5
			HC-SF121 • 201 HC-SF202 • 352 HC-SF203 • 353	HC-UF202 to 502 HC-LFS202 • 302	X:19.6 Y:49
			HA-LFS601 to12K1 HA-LFS701M to 15K1M HA-LFS502 to 22K2 HA-LFS6014 to 12K14 HA-LFS701M4 to 15K1M4 HA-LFS11K24 to 22K24	HA-LH11K2 to 22K2 HC-SF301 HC-SF502 • 702	X:11.7 Y:29.4
			HA-LFS15K1 to 37K1 HA-LFS22K1M to 37K1M HA-LFS30K2 • 37K2 HA-LFS15K14 to 37K14 HA-LFS22K1M4 to 50K1M4 HA-LFS30K24 to 55K24	HA-LF series	X,Y:9.8
		[ft/s²]	HC-KFS series HC-MFS series	HC-UFS13 to 73	X,Y:161
			HC-SFS81 HC-SFS52 to 152 HC-SFS53 to 153	HC-SFS524 to 1524 HC-RFS series HC-UFS72 • 152	X,Y:80
			HC-SFS121 • 201 HC-SFS202 • 352 HC-SFS203 • 353	HC-SFS2024 • 3524 HC-UFS202 to 502	X:80 Y:161
			HC-SFS301 HC-SFS502 • 702	HC-SFS5024 • 7024	X:80 Y:96
			HC-AQ series HC-KF series HC-MF series	HA-FF series HC-UF13 to 73	X,Y:64
			HC-SF81 HC-SF52 to 152 HC-SF53 to 153	HC-RF series HC-UF72 • 152 HC-LFS52 to152	X:32 Y:80
			HC-SF121 • 201 HC-SF202 • 352 HC-SF203 • 353	HC-UF202 to 502 HC-LFS202 • 302	X:64 Y:161
			HA-LFS601 to12K1 HA-LFS701M to 15K1M HA-LFS502 to 22K2 HA-LFS6014 to 12K14 HA-LFS701M4 to 15K1M4 HA-LFS11K24 to 22K24	HA-LH11K2 to 22K2 HC-SF301 HC-SF502 • 702	X:38.4 Y:96.5
			HA-LFS15K1 to 37K1 HA-LFS22K1M to 37K1M HA-LFS30K2 • 37K2 HA-LFS15K14 to 37K14 HA-LFS22K1M4 to 50K1M4 HA-LFS30K24 to 55K24	HA-LF series	X,Y:32

Note. Except the servo motor with reduction gear.

Vibration occurs in the directions shown below.
The values were measured at the portion which indicates the maximum value (normally the bracket opposite to load side). When the servo motor is at a stop, the bearings are likely to fret and vibration should therefore be suppressed to about half of the permissible value.



Graph of vibration servo amplitude vs. speed



2.2 Installation orientation

The following table lists directions of installation.

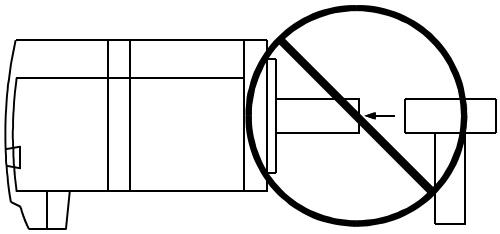
Servo Motor Series	Direction of Installation	Remarks
HC-KF HC-MF HA-FF HC-SF HC-RF HC-UF HC-KFS HC-MFS HC-SFS HC-RFS HC-UFS HC-LFS	May be installed in any direction.	For installation in the horizontal direction, it is recommended to set the connector section downward.
HC-AQ		
HA-LH HA-LFS (Flange type)		
HA-LF HA-LFS (Flange・leg type)	Horizontal direction with the legs downward.	Use either the legs or flange for installation.

When the servo motor with electromagnetic brake is installed with the shaft end at top, the brake plate may generate sliding sound but it is not a fault. Refer to section 5.3 for the installation orientation of the servo motor with reduction gear.

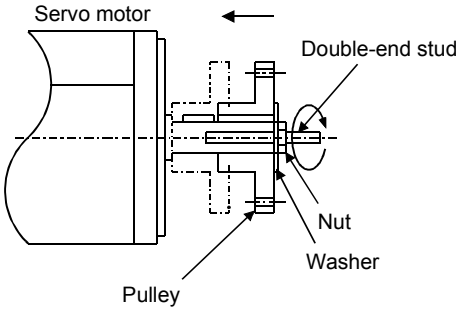
2.3 Load remove precautions

POINT

・During assembling, the shaft end must not be hammered. Doing so can cause the encoder to fail.



(1) When mounting a pulley to the servo motor shaft provided with a keyway, use the screw hole in the shaft end. To fit the pulley, first insert a double-end stud into the screw hole of the shaft, put a washer against the end face of the coupling, and insert and tighten a nut to force the pulley in.



(2) For the servo motor shaft with a keyway, use the screw hole in the shaft end. For the shaft without a keyway, use a friction coupling or the like.
(3) When removing the pulley, use a pulley remover to protect the shaft from impact.
(4) To ensure safety, fit a protective cover or the like on the rotary area, such as the pulley, mounted to the shaft.
(5) When a threaded shaft end part is needed to mount a pulley on the shaft, please contact us.
(6) The orientation of the encoder on the servo motor cannot be changed.
(7) For installation of the servo motor, use spring washers, etc. and fully tighten the bolts so that they do not become loose due to vibration.
(8) For the HC-AQ series, use spring washers and apply Screw Lock to mount the servo motor. In addition, use Helisert screws when the flange for mouthing the servo motor is made of aluminum.

2.4 Permissible load for the shaft

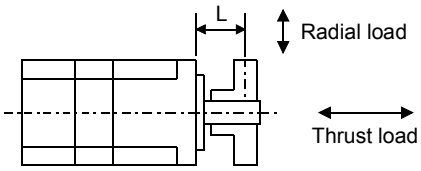
POINT
・Do not use a rigid coupling as it may apply excessive bending load to the shaft, leading to shaft breakage.

(1) Use a flexible coupling and make sure that the misalignment of the shaft is less than the permissible radial load.
(2) When using a pulley, sprocket or timing belt, select a diameter that will fit into the permissible radial load.
(3) Excess of the permissible load can cause the bearing life to reduce and the shaft to break.
(4) The load indicated in this section is static load in a single direction and does not include eccentric load. Make eccentric load as small as possible. Not doing so can cause the servo motor to be damaged.

2.4.1 Without reduction gear

Servo Motor		L (Note 1)		Permissible Radial Load (Note 2)		Permissible Thrust Load (Note 2)	
		[mm]	[in]	[N]	[lb]	[N]	[lb]
HC-KF HC-KFS	053 / 13	25	0.98	88	20	59	13
	23 / 43	30	1.18	245	55	98	22
	73 (Note 3)	40	1.57	392	88	147	33
HC-MF HC-MFS	053 / 13	25	0.98	88	20	59	13
	23 / 43	30	1.18	245	55	98	22
	73	40	1.57	392	88	147	33
HA-FF	053	30	1.18	108	24	98	22
	13	30	1.18	118	27	98	22
	23 / 33	30	1.18	176	40	147	33
	43 / 63	40	1.57	323	73	284	64
HC-SF HC-SFS	81	55	2.17	980	220	490	110
	121 to 301	79	3.11	2058	463	980	220
	52 (4) to 152 (4) (Note4)	55	2.17	980	220	490	110
	202 (4) / 702 (4) (Note4)	79	3.11	2058	463	980	220
	53 to 153	55	2.17	980	220	490	110
	203 / 353	79	3.11	2058	463	980	220
HC-LFS	52 to 152	55	2.17	980	220	490	110
	202/302	79	3.11	2058	463	980	220
HC-RF HC-RFS	103 to 203	45	1.77	686	154	196	44
	353 / 503	63	2.48	980	220	392	88
HC-UF HC-UFS	72 / 152	55	2.17	637	143	490	110
	202	65	2.56	882	198	784	176
	352 / 502	65	2.56	1176	264	784	176
	13	25	0.98	88	20	59	13
	23 / 43	30	1.18	245	55	98	22
	73	40	1.57	392	88	147	33
HA-LH	11K2	85	3.35	2450	551	980	220
	15K2 / 22K2	110	4.33	2940	661	980	220
HC-AQ	0135	16	0.63	34	8	14	3
	0235	16	0.63	44	10	14	3
	0335	16	0.63	49	11	14	3
HA-LF	30K2(4) ・ 37K2(4)	140	5.51	3234	727	1470	330
	45K24 /55K24	140	5.51	4900	1102	1960	441
HA-LFS	502/702/601(4)/701M(4)/11K2(4)	85	3.35	2450	551	980	153
	801(4) ・ 12K1(4) ・ 11K1M(4) ・ 15K1M(4) ・ 15K2(4) ・ 22K2(4)	110	4.33	2940	661	980	153
	15K1(4) ・ 20K1(4) ・ 22K1M(4) ・ 30K1M(4) ・ 30K2(4) ・ 37K2(4)	140	5.51	3234	727	1470	330
	25K1(4) ・ 30K1(4) ・ 37K1M(4) ・ 45K1M4 ・ 45K24・55K24	140	5.51	4900	1102	1960	441
	37K1(4) ・ 50K1M4	170	6.69	6370	1432	1960	441

Note 1. For the symbols in the table, refer to the following diagram.

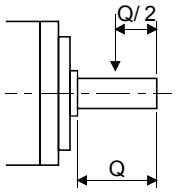


L: Distance from flange mounting surface to load center

2. Do not subject the shaft to load greater than this value. The values in the table assume that the loads work singly.
3. 73 is not available for the HC-KF series.
4. 524 to 7024 are not available for the HC-SF series.

2.4.2 With reduction gear

The permissible radial loads in the table are the values at the center of the reduction gear output shaft.



(1) HC-MF・HC-MFS・HC-KF・HC-KFS series

(a) General industrial machine-compliant

Item		Gear ratio	HC-MF053(B)G1 HC-MFS053(B)G1 HC-KF053(B)G1 HC-KFS053(B)G1	HC-MF13(B)G1 HC-MFS13(B)G1 HC-KF13(B)G1 HC-KFS13(B)G1	HC-MF23(B)G1 HC-MFS23(B)G1 HC-KF23(B)G1 HC-KFS23(B)G1	HC-MF43(B)G1 HC-MFS43(B)G1 HC-KF43(B)G1 HC-KFS43(B)G1	HC-MF73(B)G1 HC-MFS73(B)G1 HC-KFS73(B)G1
Permissible Radial Load	[N]	1/5	150		330		430
		1/12	240		710		620
		1/20	370		780	760	970
	[lb]	1/5	34		74		97
		1/12	54		160		139
		1/20	83		175	171	218
Permissible Thrust Load	[N]	1/5	200		350		430
		1/12	320		720		620
		1/20	450		780	760	960
	[lb]	1/5	45		79		97
		1/12	72		162		139
		1/20	101		175	171	216

(b) Precision application-compliant

Item		Gear ratio	HC-MF053(B)G2 HC-MFS053(B)G2 HC-KF053(B)G2 HC-KFS053(B)G2	HC-MF13(B)G2 HC-MFS13(B)G2 HC-KF13(B)G2 HC-KFS13(B)G2	HC-MF23(B)G2 HC-MFS23(B)G2 HC-KF23(B)G2 HC-KFS23(B)G2	HC-MF43(B)G2 HC-MFS43(B)G2 HC-KF43(B)G2 HC-KFS43(B)G2	HC-MF73(B)G2 HC-MFS73(B)G2 HC-KFS73(B)G2
Permissible Radial Load	[N]	1/5	160	160	160	340	390
		1/9	200	200	420	480	600
		1/20	260	540	610	790	1040
		1/29	290	610	700	900	1190
	[lb]	1/5	36	36	36	76	88
		1/9	45	45	94	108	135
		1/20	58	121	137	178	234
		1/29	65	137	157	202	268
Permissible Thrust Load	[N]	1/5	220	220	220	370	390
		1/9	270	270	450	490	600
		1/20	400	660	640	790	1140
		1/29	450	750	830	1010	1290
	[lb]	1/5	49	49	49	83	87
		1/9	61	61	101	110	135
		1/20	90	148	144	178	256
		1/29	101	167	187	227	290

(2) HA-FF series

(a) General industrial machine-compliant

Item		Gear ratio	HA-FF053(B)G1	HA-FF13(B)G1	HA-FF23(B)G1	HA-FF33(B)G1	HA-FF43(B)G1	HA-FF63(B)G1
Permissible Radial Load	[N]	1/5	588		686	686		980
		1/10	588		686	686		1470
		1/20	588		1176	1568		1764
		1/30	686		1225	1764		2156
	[lb]	1/5	132		154	154		220
		1/10	132		154	154		330
		1/20	132		264	353		397
		1/30	154		275	397		485

(b) Precision application-compliant

Item		Gear ratio	HA-FF053(B)G2	HA-FF13(B)G2	HA-FF23(B)G2	HA-FF33(B)G2	HA-FF43(B)G2	HA-FF63(B)G2
Permissible Radial Load	[N]	1/5	69	69	98	216	216	588
		1/9					735	735
		1/10	88	127	265	265		
		1/15	137	216	392			
		1/20			980	980	1274	1274
		1/25	392	784				
		1/29			1078	1470	1470	1470
		1/45		1274	1666	1666	1666	3430
	[lb]	1/5	15	15	22	49	49	132
		1/9					165	165
		1/10	20	29	60	60		
		1/15	31	49	88			
		1/20			220	220	286	286
		1/25	88	176				
		1/29			242	330	330	330
		1/45		286	375	375	375	771
Permissible Thrust Load	[N]	1/5	59	59	147	265	265	784
		1/9					980	980
		1/10	78	167	343	343		
		1/15	88	216	363			
		1/20			1372	1372	2254	2254
		1/25	314	412				
		1/29			1764	2548	2548	2548
		1/45		1960	3234	3234	3234	5390
	[lb]	1/5	13	13	33	60	60	176
		1/9					220	220
		1/10	16	38	77	77		
		1/15	20	49	82			
		1/20			308	308	507	507
		1/25	71	93				
		1/29			397	573	573	573
		1/45		441	727	727	727	1212

(3) HC-SF・HC-SFS (2000r/min) series

(a) General industrial machine-compliant

Item		Gear ratio	HC-SF52(B)G1 HC-SFS52(B)G1 HC-SFS524(B)G1	HC-SF102(B)G1 HC-SFS102(B)G1 HC-SFS1024(B)G1	HC-SF152(B)G1 HC-SFS152(B)G1 HC-SFS1524(B)G1	HC-SF202(B)G1 HC-SFS202(B)G1 HC-SFS2024(B)G1	HC-SF352(B)G1 HC-SFS352(B)G1 HC-SFS3524(B)G1	HC-SF502(B)G1 HC-SFS502(B)G1 HC-SFS5024(B)G1	HC-SF702(B)G1 HC-SFS702(B)G1 HC-SFS7024(B)G1
Permissible Radial Load	[N]	1/6	2058	2842	2842	2842	3332		
		1/11	2391	3273	3273	3273	3871	5488	7526
		1/17	2832	3646	3646	3646	4420	6468	8683
		1/29	3273	4410	5135	7291	7291	13426	13426
		1/35	5253	5253	6047	8555	8555	16072	16072
		1/43	5253	6047	8555	8555	11662	16072	22540
		1/59	5880	9741	9741	9741	13132		
	[lb]	1/6	463	639	639	639	749		
		1/11	538	728	728	728	870	1234	1952
		1/17	637	820	820	820	994	1454	1952
		1/29	728	991	1154	1639	1639	3018	3018
		1/35	1181	1181	1359	1923	1923	3613	3613
		1/43	1181	1359	1923	1923	2622	3613	5067
		1/59	1322	2190	2190	2190	2952		
Permissible Thrust Load	[N]	1/6	1470	2352	2352	2352	3920		
		1/11	1470	2764	2764	2764	3920	6292	8085
		1/17	1470	2940	2940	2940	3920	6860	9673
		1/29	1470	2940	3920	6860	6860	13720	13720
		1/35	2940	2940	3920	6860	6860	13720	13720
		1/43	2940	3920	6860	6860	9800	13720	19600
		1/59	2940	6860	6860	6860	9800		
	[lb]	1/6	330	529	529	529	881		
		1/11	330	621	621	621	881	1415	1818
		1/17	330	661	661	661	881	1542	2175
		1/29	330	661	881	1542	1542	3084	3084
		1/35	661	661	881	1542	1542	3084	3084
		1/43	661	881	1542	1542	2203	3084	4406
		1/59	661	1542	1542	1542	2203		

(b) Precision application-compliant

Item		Gear ratio	HC-SF52(B)G2 HC-SFS52(B)G2 HC-SFS524(B)G2	HC-SF102(B)G2 HC-SFS102(B)G2 HC-SFS1024(B)G2	HC-SF152(B)G2 HC-SFS152(B)G2 HC-SFS1524(B)G2	HC-SF202(B)G2 HC-SFS202(B)G2 HC-SFS2024(B)G2	HC-SF352(B)G2 HC-SFS352(B)G2 HC-SFS3524(B)G2	HC-SF502(B)G2 HC-SFS502(B)G2 HC-SFS5024(B)G2	HC-SF702(B)G2 HC-SFS702(B)G2 HC-SFS7024(B)G2
Permissible Radial Load	[N]	1/5	833	833	833	1666	3822	3822	3822
		1/9	980	980	1960	1960	4704	4704	
		1/20	1274	2646	2646	6076	6076		
		1/29	2940	2940	6860	6860			
		1/45	3430	8036	8036	8036			
	[lb]	1/5	187	187	187	375	859	859	859
		1/9	220	220	441	441	1058	1058	
		1/20	286	595	595	1366	1366		
		1/29	661	661	1542	1542			
		1/45	771	1807	1807	1807			
Permissible Thrust Load	[N]	1/5	1176	1176	1176	2156	5488	5488	5488
		1/9	1568	1568	2646	2646	7252	7252	
		1/20	2254	3724	3724	9506	9506		
		1/29	4704	4704	11760	11760			
		1/45	5390	14700	14700	14700			
	[lb]	1/5	264	264	264	485	1234	1234	1234
		1/9	353	353	595	595	1630	1630	
		1/20	507	837	837	2137	2137		
		1/29	1058	1058	2644	2644			
		1/45	1212	3305	3305	3305			

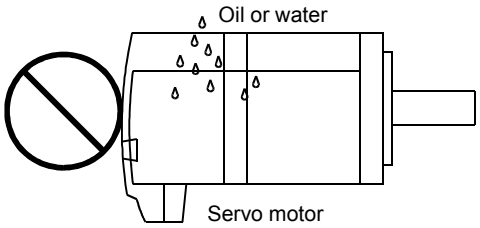
(4) HC-RF・HC-RFS series

Item		Gear ratio	HC-RF103(B)G2 HC-RFS103(B)G2	HC-RF153(B)G2 HC-RFS153(B)G2	HC-RF203(B)G2 HC-RFS203(B)G2	HC-RF353(B)G2 HC-RFS353(B)G2	HC-RF503(B)G2 HC-RFS503(B)G2
Permissible Radial Load	[N]	1/5	833	833	833	1666	3822
		1/9	980	1960	1960	4704	4704
		1/20	2646	2646	2646	6076	6076
		1/29	2940	2940	6860	6860	
		1/45	3430	8036	8036		
	[lb]	1/5	187	187	187	375	859
		1/9	220	441	441	1058	1058
		1/20	595	595	595	1366	1366
		1/29	661	661	1542	1542	
		1/45	771	1806	1806		
Permissible Thrust Load	[N]	1/5	1176	1176	1176	2156	5488
		1/9	1568	2646	2646	7252	7252
		1/20	3724	3724	3724	9506	9506
		1/29	4704	4704	11760	11760	
		1/45	5390	14700	14700		
	[lb]	1/5	264	264	264	485	1234
		1/9	353	595	595	1630	1630
		1/20	837	837	837	2137	2137
		1/29	1058	1058	2644	2644	
		1/45	1212	3305	3305		

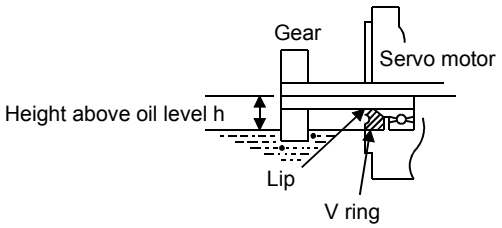
2.5 Protection from oil and water

(1) Next, the servo motor is not waterproof (IP44). Do not subject the servo motor to oil and water. Especially for the HC-MF・HC-KF・HC-AQ・HC-KFS・HC-MFS and HA-FF series, do not subject the shaft-through portion to oil.

Servo Motor Series	Protection
HC-KF/HC-MF HA-LF/HA-FF/HA-LFS	IP44
HC-AQ/HC-KFS/HC-MFS	IP55
HA-LH	JP44



(2) When the gear box is mounted horizontally, the oil level in the gear box should always be lower than the oil seal lip on the servo motor shaft. If it is higher than the oil seal lip, oil will enter the servo motor, leading to a fault.
The HC-MF・HC-KF・HC-AQ・HC-MFS and HC-KFS series servo motor is not equipped with an oil seal and cannot be used with the gear box as described above. Oil should be shut off on the gear box side.
In a special specification article with an oil seal is available. Please contact Mitsubishi.

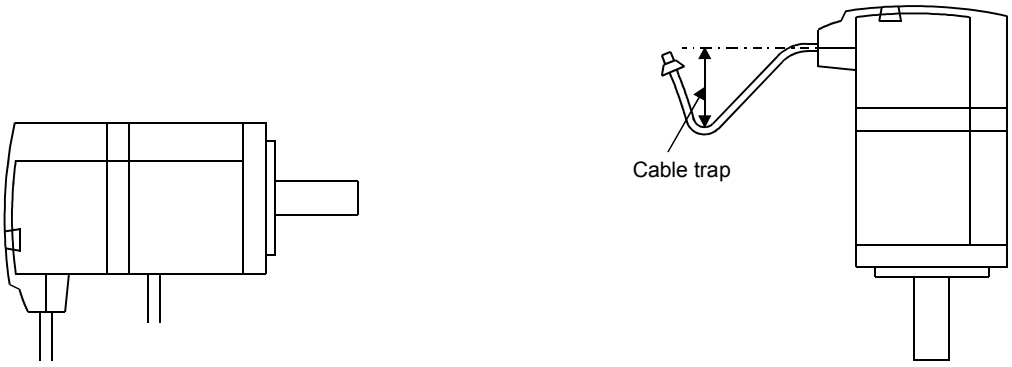


Servo Motor		Height above Oil Level h	
		[mm]	[in]
HC-SF HC-SFS	81	20	0.79
	121 to 301	25	0.98
	52(4) to 152(4) (Note)	20	0.79
	202(4) to 702(4) (Note)	25	0.98
	53 to 153	20	0.79
	203/353	25	0.98
HC-LFS	52 to 152	20	0.79
	202/302	25	0.98
HC-RF HC-RFS	103 to 503	20	0.79
HC-UF HC-UFS	72/152	20	0.79
	202 to 502	25	0.98
	13	12	0.47
	23/43	14	0.55
	73	20	0.79

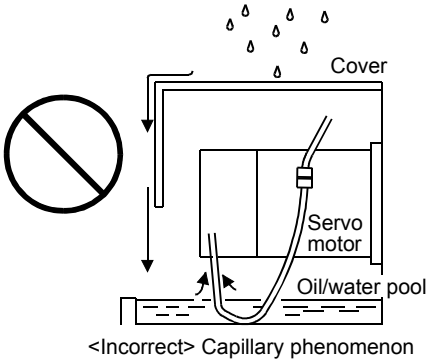
Servo Motor		Height above Oil Level h	
		[mm]	[in]
HA-FF	053/13	8	0.32
	23/33	12	0.47
	43/63	14	0.55
HA-LH	11K2	30	0.18
	15K2/22K2	40	1.58
HA-LF	30K2(4)・37K2(4)	45	1.77
	45K24/55K24	48	1.89
HA-LFS	502・702・601(4)・701M(4)・11K2(4)	34	1.34
	15K1(4)・20K1(4)・22K1M(4)・30K1M(4)・30K2(4)・37K2(4)	45	1.77
	801(4)・12K1(4)・25K1(4)・30K1(4)・11K1M(4)・15K1M(4)・37K1M(4)・45K1M4・15K2(4)・22K2(4)・45K24・55K24	48	1.89
	37K1(4)・50K1M4	55	2.17

Note. 524 to 7024 are not available for the HC-SF series.

(3) When installing the servo motor horizontally, face the power cable and encoder cable downward. When installing the servo motor vertically or obliquely, provide a trap for the cable.

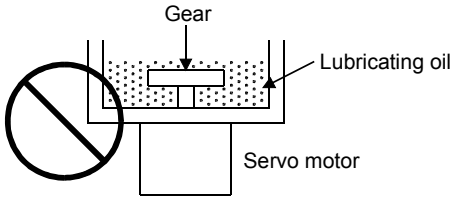


(4) Do not use the servo motor with its cable soaked in oil or water. (Figure on the right)



<Incorrect> Capillary phenomenon

(5) When the servo motor is to be installed with the shaft end at top, provide measures so that it is not exposed to oil and water entering from the machine side, gear box, etc.



(6) If the servo motor is exposed to oil such as coolant, the sealant, packing, cable and others may be affected depending on the oil type.

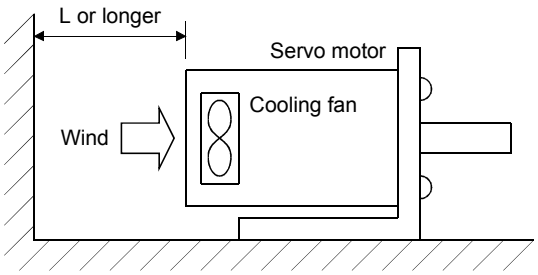
(7) In the environment where the servo motor is exposed to oil mist, oil, water, grease and/or like, the servo motor of the standard specifications may not be usable. Contact us.

(8) In the case of the servo motor with oil seal, the oil seal may sound during operation. It poses no problems in function.

2.6 Cooling fan

The HA-LH・HA-LF and HA-LFS servo motors have a cooling fan. Leave the following distance between the servo motor's suction face and the wall.

Servo Motor Series	Distance L	
	[mm]	[in]
HA-LH series	50	1.97
HA-LFS601 to 12K1 HA-LFS701M to 15K1M HA-LFS11K2 to 22K2 HA-LFS6014 to 12K14 HA-LFS701M4 to 15K1M4 HA-LFS11K24 to 22K24	100	3.94
HA-LF30K2/37K2 HA-LF30K24 to 55K24 HA-LFS15K1 to 37K1 HA-LFS22K1M to 37K1M HA-LFS30K2/37K2 HA-LFS15K14 to 37K14 HA-LFS22K1M4 to 50K1M4 HA-LFS30K24 to 55K24	150	5.91



2.7 Cable

The power supply and encoder cables routed from the servo motor should be fixed to the servo motor to keep them unmovable. Otherwise, cable breaks may occur. In addition, do not modify the connectors, terminals and others at the ends of the cables.

MEMO

3. CONNECTORS USED FOR SERVO MOTOR WIRING

> **POINT**
>
> ・Protective structure indicated for cables and connecters is for a cable or connector alone. When the cables and connectors are used to connect the servo amplifier and servo motor, and if protective structures of the servo amplifier and servo motor are lower than that of the cable and connector, specifications of the servo amplifier and servo motor apply.

3.1 Makeups

This section gives connector makeups on an operating environment basis. Use the models of the manufacturers given or equivalent.

3.1.1 HC-KF(-UE)・HC-MF(-UE)・HA-FF・HC-UF3000r/min series

Use round crimping terminals (1.25-4) for connection of the power supply and electromagnetic brake. For connection of the encoder, use the connector indicated in this section or equivalent. This connector may be used with the EN Standard and UL/C-UL Standard but is not waterproof.

Servo Motor	Connector Supplied for Servo Motor (Tyco Electronics)	Cable Side Connector		
		Housing (Tyco Electronics)	Connector Pin (Tyco Electronics)	Cable Clamp (Toa Electric Industry)
HC-KF□ (B) HC-KF□ (B)-UE HC-MF□ (B) HC-MF□ (B) -UE HA-FF□ (B) HC-UF13 to 73(B)	1-172169-9	1-172161-9	170359-1 170363-1 (loose piece)	MTI-0002

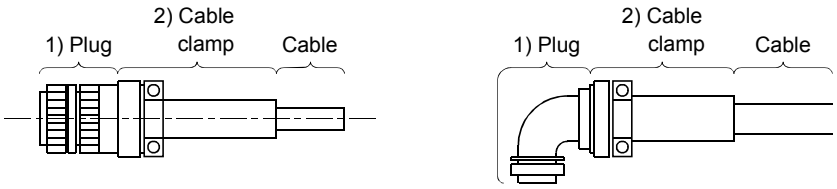
3.1.2 HA-FF□C-UE series

If used with a waterproof connector, the HA-FF□C(B)-UE does not improve in ingress protection (IP54).

(1) Non-waterproof, UL/C-UL Standard-compliant

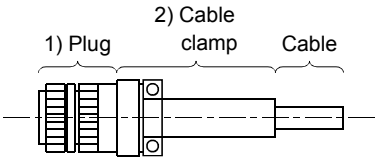
(a) When using cabtyre cables

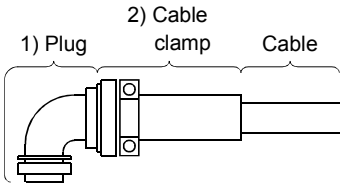
1) For connection of power supply



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector		
		1) Plug (DDK)		2) Cable clamp (DDK)
		Type	Model	
HA-FF□C(B) -UE	CE05-2A14S-2PD-B	Straight	D/MS3106B14S-2S	D/MS3057-6A
		Angle	D/MS3108B14S-2S	

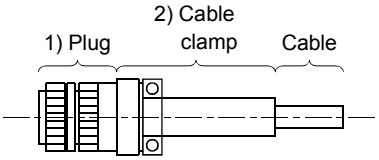
2) For connection of encoder





Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector		
		1) Plug (DDK)		2) Cable clamp (DDK)
		Type	Model	
HA-FF□C(B) -UE	MS3102A20-29P	Straight	D/MS3106B20-29S	D/MS3057-12A
		Angle	D/MS3108B20-29S	

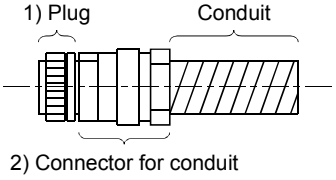
3) For connection of brake

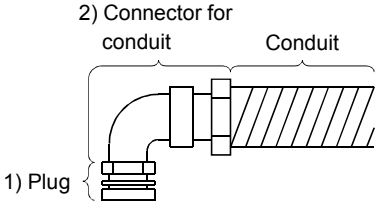


Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector		
		Plug (DDK)		2) Cable clamp (DDK)
		Type	Model	
HA-FF□CB-UE	MS3102A10SL-4P	Straight	D/MS3106A10SL-4S	D/MS3057-4A

(b) When using flexible conduits

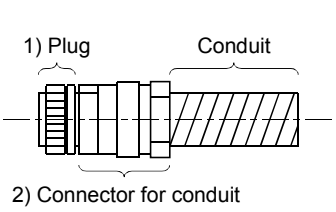
1) For connection of power supply

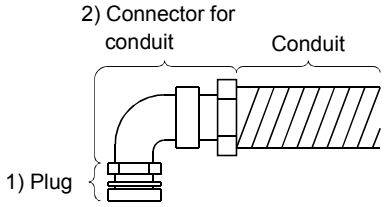




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□C(B) -UE	CE05-2A14S-2PD-B	D/MS3106A14S-2S(D190)	Straight	Nippon flex	1/4	RCC-102RL-MS14F	VF-02	8.3
					3/8	RCC-103RL-MS14F	VF-03	10.6
					1/2	RCC-104RL-MS14F	VF-04	14.0
				Daiwa Dengyo	10	MSA-10-14	FCV10	10.0
					12	MSA-12-14	FCV12	12.3
			Angle	Nippon flex	1/4	RCC-302RL-MS14F	VF-02	8.3
					3/8	RCC-303RL-MS14F	VF-03	10.6
					1/2	RCC-304RL-MS14F	VF-04	14.0
				Daiwa Dengyo	10	MAA-10-14	FCV10	10.0
					12	MAA-12-14	FCV12	12.3

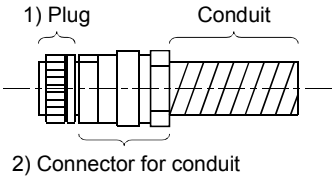
2) For connection of encoder

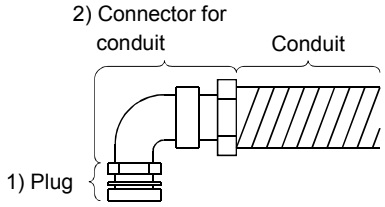




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□C(B)-UE	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS20F	VF-04	14.0
					3/4	RCC-106RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MSA-16-20	FCV16	15.8
					22	MSA-22-20	FCV22	20.8
			Angle	Nippon flex	1/2	RCC-304RL-MS20F	VF-04	14.0
					3/4	RCC-306RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MAA-16-20	FCV16	15.8
					22	MAA-22-20	FCV22	20.8

3) For connection of brake



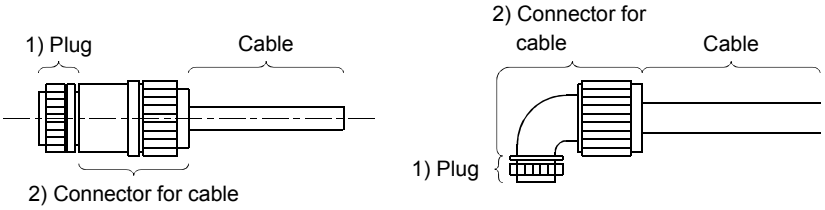


Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□CB-UE	MS3102A10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	1/4	RCC-102RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MSA-10-10	FCV10	10.0
			Angle	Nippon flex	1/4	RCC-302RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MAA-10-10	FCV10	10.0

(2) EN Standard, UL/C-UL Standard-compliant

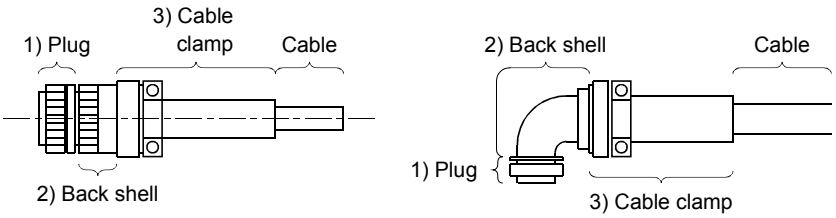
(a) When using cabtyre cables

1) For connection of power supply



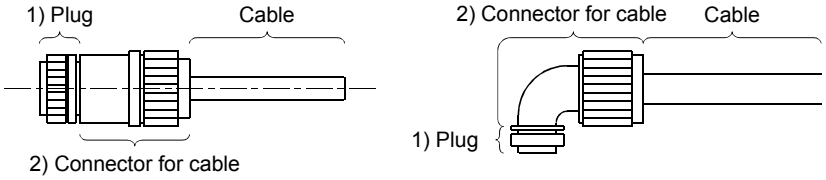
Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Connector for Cable			
			Type	Manufacturer	Cable OD	Model
HA-FF□C(B)-UE	CE05-2A14S-2PD-B	CE05-6A14S-2SD-D	Straight	Nippon flex	4 to 8	ACS-08RL-MS14F
					8 to 12	ACS-12RL-MS14F
				Daiwa Dengyo	5 to 8.3	YSO14-5 to 8
					8.3 to 11.3	YSO14-9 to 11
			Angle	Nippon flex	4 to 8	ACA-08RL-MS14F
					8 to 12	ACA-12RL-MS14F
				Daiwa Dengyo	5 to 8.3	YLO14-5 to 8
					8.3 to 11.3	YLO14-9 to 11

2) For connection of encoder



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Back Shell (DDK)		3) Cable Clamp (DDK)	
			Type	Model	Cable OD	Model
HA-FF□C(B)-UE	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	CE02-20BS-S-D	6.8 to 10	CE3057-12A-3-D
			Angle	CE-20BA-S-D		

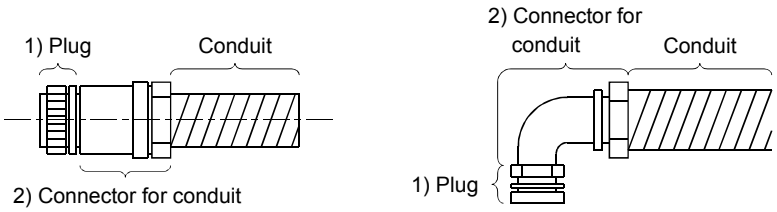
3) For connection of brake



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Cable Connector			
			Type	Manufacturer	Cable OD	Model
HA-FF□CB-UE	MS3102A10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	4 to 8	ACS-08RL-MS10F
					8 to 12	ACS-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YS010-5 to 8
			Angle	Nippon flex	4 to 8	ACA-08RL-MS10F
					8 to 12	ACA-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YL010-5 to 8

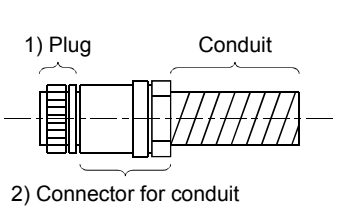
(b) When using flexible conduits

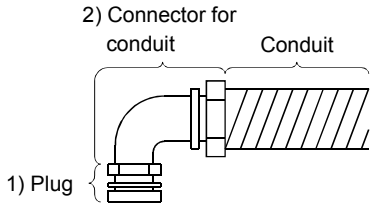
1) For connection of power supply



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□C(B)-UE	CE05-2A14S-2PD-B	CE05-6A14S-2SD-D	Straight	Nippon flex	1/4	RCC-102RL-MS14F	VF-02	8.3
					3/8	RCC-103RL-MS14F	VF-03	10.6
					1/2	RCC-104RL-MS14F	VF-04	14.0
				Daiwa Dengyo	10	MSA-10-14	FCV10	10.0
					12	MSA-12-14	FCV12	12.3
			Angle	Nippon flex	1/4	RCC-302RL-MS14F	VF-02	8.3
					3/8	RCC-303RL-MS14F	VF-03	10.6
					1/2	RCC-304RL-MS14F	VF-04	14.0
				Daiwa Dengyo	10	MAA-10-14	FCV10	10.0
					12	MAA-12-14	FCV12	12.3

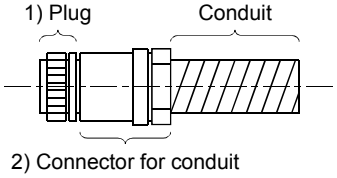
2) For connection of encoder

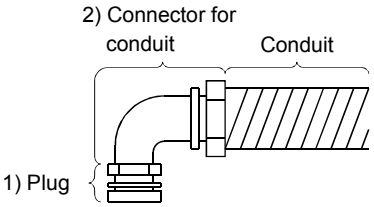




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□C(B)-UE	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS20F	VF-04	14.0
					3/4	RCC-106RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MSA-16-20	FCV16	15.8
					22	MSA-22-20	FCV22	20.8
			Angle	Nippon flex	1/2	RCC-304RL-MS20F	VF-04	14.0
					3/4	RCC-306RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MAA-16-20	FCV16	15.8
					22	MAA-22-20	FCV22	20.8

3) For connection of brake





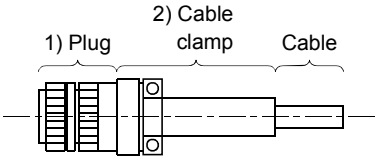
Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Cable Connector				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HA-FF□CB-UE	MS3102A10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	1/4	RCC-102RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MSA-10-10	FCV10	10.0
			Angle	Nippon flex	1/4	RCC-302RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MAA-10-10	FCV10	10.0

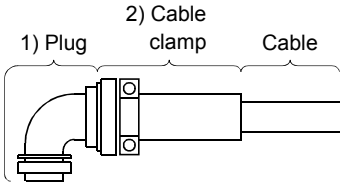
3.1.3 HC-SF(S)・HC-RF(S)・HC-UF(S)2000r/min, HA-LH・HA-LF・HA-LFS・HC-LFS series

(1) Non-waterproof, UL/C-UL Standard-compliant

(a) When using cabtyre cables

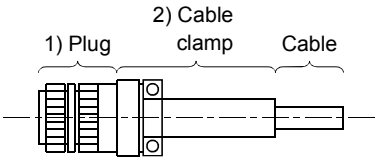
1) For connection of power supply

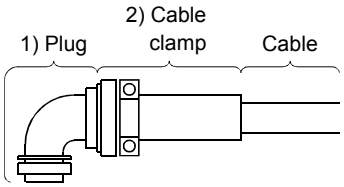




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector		
		1) Plug (DDK)		2) Cable clamp (DDK)
		Type	Model	
HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B)・152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B)・152(B) HC-LFS52(B) to 152(B)	CE05-2A22-23PD-B	Straight	D/MS3106B22-23S	D/MS3057-12A
		Angle	D/MS3108B22-23S	
HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B)・353(B) HC-RF353(B) to 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B) to 353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B)・503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B)・302(B)	CE05-2A24-10PD-B	Straight	D/MS3106B24-10S	D/MS3057-16A
		Angle	D/MS3108B24-10S	
HC-SF702(B) HC-SFS702(B) HC-SFS7024(B) HA-LFS702	CE05-2A32-17PD-B	Straight	D/MS3106B32-17S	D/MS3057-20A
		Angle	D/MS3108B32-17S	

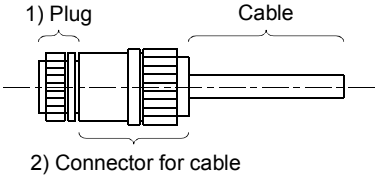
2) For connection of encoder

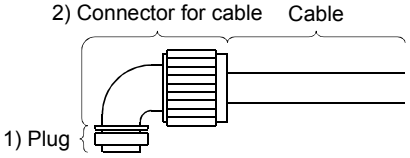




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector		
		1) Plug (DDK)		2) Cable clamp (DDK)
		Type	Model	
HC-SF81(B) to 301(B) HC-SF52(B) to 702(B) HC-SF53(B) to 353(B) HC-RF103(B) to 503(B) HC-UF72(B) to 502(B) HC-SFS81(B) to 301(B) HC-SFS52(B) to 702(B) HC-SFS53(B) to 353(B) HC-SFS524(B) to 7024(B) HC-RFS103(B) to 503(B) HC-UFS72(B) to 502(B)	MS3102A20-29P	Straight	D/MS3106B20-29S	D/MS3057-12A
HA-LH11K2 to 22K2 HA-LF30K24 to 55K24 HA-LF30K2・37K2 HA-LFS601 to 37K1 HA-LFS701M to 37K1M HA-LFS502 to 37K2 HA-LFS6014 to 37K14 HA-LFS701M4 to 50K1M4 HA-LFS11K24 to 55K24 HC-LFS52(B) to 302(B)		Angle	D/MS3108B20-29S	

3) For connection of brake

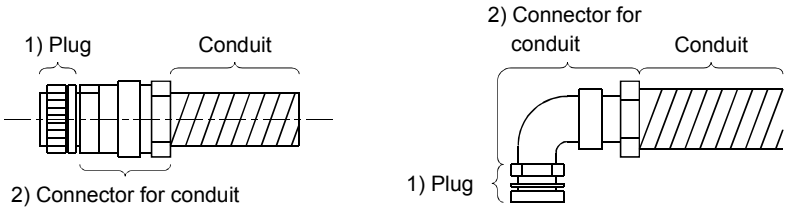




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Connector for Cable			
			Type	Manufacturer	Cable OD	Model
HC-SF121B to 301B HC-SF202B to 702B HC-SF203B・353B HC-UF202B to 502B HC-SFS121B to 301B HC-SFS202B to 702B HC-SFS203B・353B HC-SFS2024B to 7024B HC-UFS202B to 502B HC-LFS202B・302B	MS3102A10SL-4P	D/MS3106A10SL-4S (D190)	Straight	Nippon flex	4 to 8	ACS-08RL-MS10F
					8 to 12	ACS-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YSO10-5 to 8
			Angle	Nippon flex	4 to 8	ACA-08RL-MS10F
					8 to 12	ACA-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YLO10-5 to 8

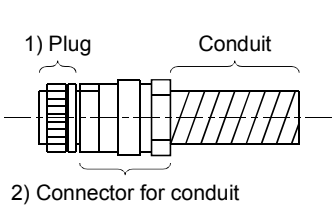
(b) When using flexible conduits

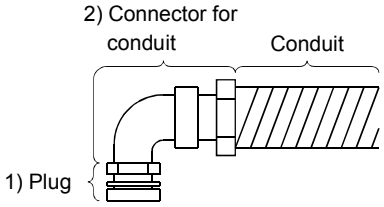
1) For connection of power supply



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B)・152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B)・152(B) HC-LFS52(B) to 152(B)	CE05-2A22-23PD-B	D/MS3106A22-23S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS22F	VF-04	14.0
					3/4	RCC-106RL-MS22F	VF-06	19.0
					1	RCC-108RL-MS22F	VF-08	24.4
				Daiwa Dengyo	16	MSA-16-22	FCV16	15.8
					22	MSA-22-22	FCV22	20.8
					28	MSA-28-22	FCV28	26.4
			Angle	Nippon flex	1/2	RCC-304RL-MS22F	VF-04	14.0
					3/4	RCC-306RL-MS22F	VF-06	19.0
					1	RCC-308RL-MS22F	VF-08	24.4
				Daiwa Dengyo	16	MAA-16-22	FCV16	15.8
					22	MAA-22-22	FCV22	20.8
					28	MAA-28-22	FCV28	26.4
HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B)・352(B) HC-RF353(B) to 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B) to 353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B)・503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B)・302(B)	CE05-2A24-10PD-B	D/MS3106A24-10S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS24F	VF-04	14.0
					3/4	RCC-106RL-MS24F	VF-06	19.0
					1	RCC-108RL-MS24F	VF-08	24.4
				Daiwa Dengyo	16	MSA-16-24	FCV16	15.8
					22	MSA-22-24	FCV22	20.8
					28	MSA-28-24	FCV28	26.4
			Angle	Nippon flex	1/2	RCC-304RL-MS24F	VF-04	14.0
					3/4	RCC-306RL-MS24F	VF-06	19.0
					1	RCC-308RL-MS24F	VF-08	24.4
				Daiwa Dengyo	16	MAA-16-24	FCV16	15.8
					22	MAA-22-24	FCV22	20.8
					28	MAA-28-24	FCV28	26.4
HC-SF702(B) HC-SFS702(B) HC-SFS7024(B) HA-LFS702	CE05-2A32-17PD-B	D/MS3106A32-17S(D190)	Straight	Nippon flex	3/4	RCC-106RL-MS32F	VF-06	19.0
					1	RCC-108RL-MS32F	VF-08	24.4
			Angle	Daiwa Dengyo	3/4	RCC-306RL-MS32F	VF-06	19.0
					1	RCC-308RL-MS32F	VF-08	24.4

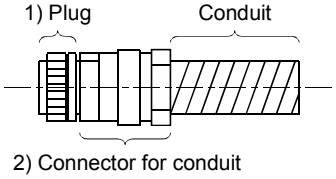
2) For connection of encoder

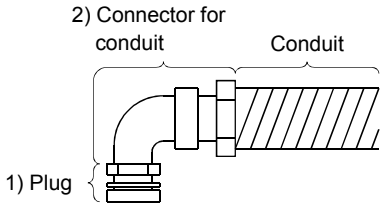




Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF81(B) to 301(B) HC-SF52(B) to 702(B) HC-SF53(B) to 353(B) HC-RF103(B) to 503(B) HC-UF72(B) to 502(B) HC-SFS81(B) to 301(B) HC-SFS52(B) to 702(B) HC-SFS53(B) to 353(B) HC-SFS5024(B) to 7024(B) HC-RFS103(B) to 503(B) HC-UFS72(B) to 502(B) HA-LH11K2 to 22K2 HA-LF30K24 to 55K24 HA-LF30K2・37K2 HA-LFS601 to 37K1 HA-LFS701M to 37K1M HA-LFS502 to 37K2 HA-LFS6014 to 37K14 HA-LFS701M4 to 50K1M4 HA-LFS11K24 to 55K24 HC-LFS52(B) to 302(B)	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS20F	VF-04	14.0
					3/4	RCC-106RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MSA-16-20	FCV16	15.8
					22	MSA-22-20	FCV22	20.8
			Angle	Nippon flex	1/2	RCC-304RL-MS20F	VF-04	14.0
					3/4	RCC-306RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MAA-16-20	FCV16	15.8
					22	MAA-22-20	FCV22	20.8

3) For connection of brake



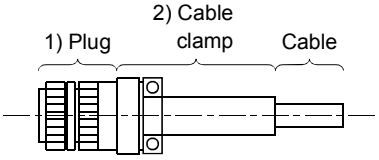


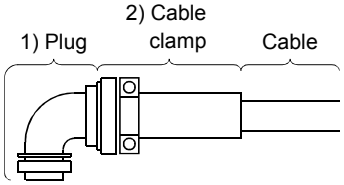
Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF121B to 301B HC-SF202B to 702B HC-SF203B・353B HC-UF202B to 502B HC-SFS121B to 301B HC-SFS202B to 702B HC-SFS203B・353B HC-SFS2024B to 7024B HC-UFS202B to 502B HC-LFS202B・302B	MS3102A 10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	1/4	RCC-102RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MSA-10-10	FCV10	10
			Angle	Nippon flex	1/4	RCC-302RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MAA-10-10	FCV10	10

(2) Waterproof (IP65), EN Standard, UL/C-UL Standard-compliant

(a) When using cabtyre cables

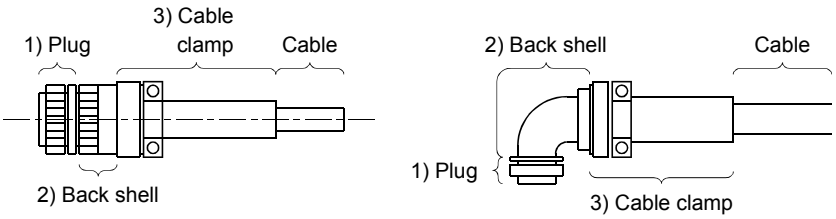
1) For connection of power supply





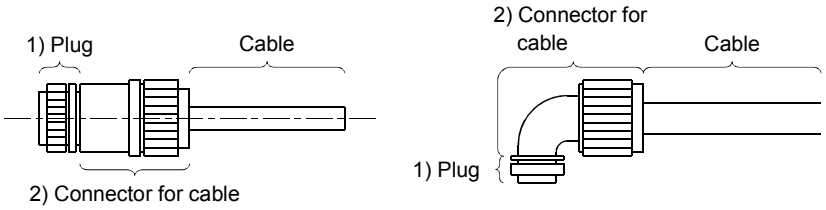
Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector			
		1) Plug (DDK)		2) Cable clamp (DDK)	
		Type	Model	Cable OD	Model
HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B)・152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B)・152(B) HC-LFS52(B) to 152(B)	CE05-2A22-23PD-B	Straight	CE05-6A22-23SD-D-BSS	9.5 to 13	CE3057-12A-2-D
		Angle	CE05-8A22-23SD-D-BAS	12.5 to 16	CE3057-12A-1-D
HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B)・353(B) HC-RF353(B) to 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B)・353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B)・503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B)・302(B)	CE05-2A24-10PD-B	Straight	CE05-6A24-10SD-D-BSS	13 to 15.5	CE3057-16A-2-D
		Angle	CE05-8A24-10SD-D-BAS	15 to 19.1	CE3057-16A-1-D
HC-SF702(B) HC-SFS702(B) HC-SFS7024(B) HA-LFS702	CE05-2A32-17PD-B	Straight	CE05-6A32-17SD-D-BSS	22 to 23.8	CE3057-20A-1-D
		Angle	CE05-8A32-17SD-D-BAS		

2) For connection of encoder



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Back shell		3) Cable clamp (DDK)	
			Type	Model	Cable OD	Model
HC-SF81(B) to 301(B) HC-SF52(B) to 702(B) HC-SF53(B) to 353(B) HC-RF103(B) to 503(B) HC-UF72(B) to 502(B) HC-SFS81(B) to 301(B) HC-SFS52(B) to 702(B) HC-SFS53(B) to 353(B) HC-SFS524(B) to 7024(B) HC-RFS103(B) to 502(B) HC-UFS72(B) to 502(B) HA-LH11K2 to 22K2 HA-LF30K24 to 55K24 HA-LF30K2・37K2 HA-LFS601 to 37K1 HA-LFS701M to 37K1M HA-LFS502 to 37K2 HA-LFS6014 to 37K14 HA-LFS701M4 to 50K1M4 HA-LFS11K24 to 55K24 HC-LFS52(B) to 302(B)	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	CE02-20BS-S-D	6.8 to 10	CE3057-12A-3-D
			Angle	CE-20BA-S-D		

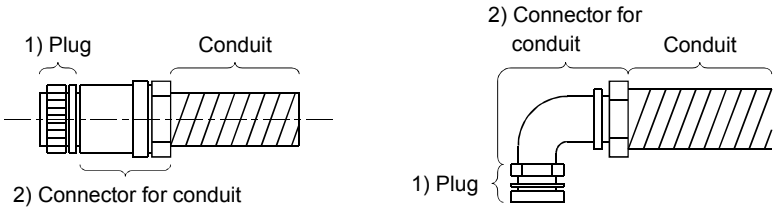
3) For connection of brake



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector				
		1) Plug (DDK)	2) Connector for Cable			
			Type	Manufacturer	Cable OD	Model
HC-SF121B to 301B HC-SF202B to 702B HC-SF203B・353B HC-UF202B to 502B HC-SFS121B to 301B HC-SFS202B to 702B HC-SFS203B・353B HC-SFS2024B to 7024B HC-UFS202B to 502B HC-LFS202B・302B HA-LFS601B to 801B HA-LFS701MB to 15K1MB HA-LFS11K2B to 22K2B HA-LFS6014B to 8014B HA-LFS701M4B to 15K1M4B HA-LFS11K24B to 22K24B	MS3102A10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	4 to 8	ACS-08RL-MS10F
					8 to 12	ACS-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YSO-10-5 to 8
			Angle	Nippon flex	4 to 8	ACA-08RL-MS10F
					8 to 12	ACA-12RL-MS10F
				Daiwa Dengyo	5 to 8.3	YLO-10-5 to 8

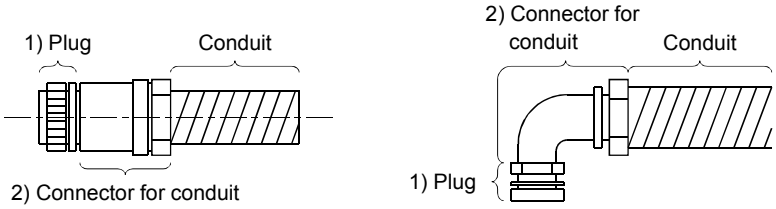
(b) When using flexible conduits

1) For connection of power supply



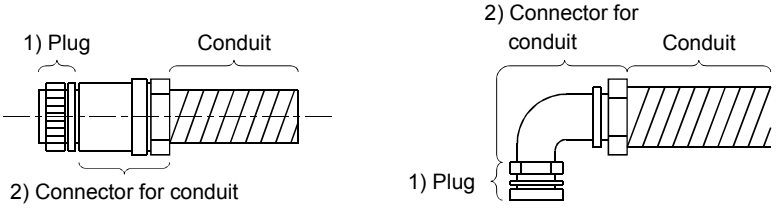
Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B)・152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B)・152(B) HC-LFS52(B) to 152(B)	CE05-2A22-23PD-B	CE05-6A22-23SD-D	Straight	Nippon flex	1/2	RCC-104RL-MS22F	VF-04	14.0
					3/4	RCC-106RL-MS22F	VF-06	19.0
					1	RCC-108RL-MS22F	VF-08	24.4
				Daiwa Dengyo	16	MSA-16-22	FCV16	15.8
					22	MSA-22-22	FCV22	20.8
					28	MSA-28-22	FCV28	26.4
			Angle	Nippon flex	1/2	RCC-304RL-MS22F	VF-04	14.0
					3/4	RCC-306RL-MS22F	VF-06	19.0
					1	RCC-308RL-MS22F	VF-08	24.4
				Daiwa Dengyo	16	MAA-16-22	FCV16	15.8
					22	MAA-22-22	FCV22	20.8
					28	MAA-28-22	FCV28	26.4
HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B)・353(B) HC-RF353(B) to 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B)・353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B)・503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B)・302(B)	CE05-2A24-10PD-B	CE05-6A24-10SD-D	Straight	Nippon flex	1/2	RCC-104RL-MS24F	VF-04	14.0
					3/4	RCC-106RL-MS24F	VF-06	19.0
					1	RCC-108RL-MS24F	VF-08	24.4
				Daiwa Dengyo	16	MSA-16-24	FCV16	15.8
					22	MSA-22-24	FCV22	20.8
					28	MSA-28-24	FCV28	26.4
			Angle	Nippon flex	1/2	RCC-304RL-MS24F	VF-04	14.0
					3/4	RCC-306RL-MS24F	VF-06	19.0
					1	RCC-308RL-MS24F	VF-08	24.4
				Daiwa Dengyo	16	MAA-16-24	FCV16	15.8
					22	MAA-22-24	FCV22	20.8
					28	MAA-28-24	FCV28	26.4
HC-SF702(B) HC-SFS702(B) HC-SFS7024(B) HA-LFS702	CE05-2A32-17PD-B	CE05-6A32-17SD-D	Straight	Nippon flex	3/4	RCC-106RL-MS32F	VF-06	19.0
					1	RCC-108RL-MS32F	VF-08	24.4
			Angle	Nippon flex	3/4	RCC-306RL-MS32F	VF-06	19.0
					1	RCC-308RL-MS32F	VF-08	24.4

2) For connection of encoder



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF81(B) to 301(B) HC-SF52(B) to 702(B) HC-SF53(B) to 353(B) HC-RF103(B) to 503(B) HC-UF72(B) to 502(B) HC-SFS81(B) to 301(B) HC-SFS52(B) to 702(B) HC-SFS53(B) to 353(B) HC-SFS524(B) to 7024(B) HC-RFS103(B) to 503(B) HC-UFS72(B) to 502(B) HA-LH11K2 to 22K2 HA-LF30K24 to 55K24 HA-LF30K2・37K2 HA-LFS601 to 37K1 HA-LFS701M to 37K1M HA-LFS502 to 37K2 HA-LFS6014 to 37K14 HA-LFS701M4 to 50K1M4 HA-LFS11K24 to 55K24 HC-LFS52(B) to 302 (B)	MS3102A20-29P	D/MS3106A20-29S(D190)	Straight	Nippon flex	1/2	RCC-104RL-MS20F	VF-04	14.0
					3/4	RCC-106RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MSA-16-20	FCV16	15.8
					22	MSA-22-20	FCV22	20.8
			Angle	Nippon flex	1/2	RCC-304RL-MS20F	VF-04	14.0
					3/4	RCC-306RL-MS20F	VF-06	19.0
				Daiwa Dengyo	16	MAA-16-20	FCV16	15.8
					22	MAA-22-20	FCV22	20.8

3) For connection of brake



Servo Motor	Connector Supplied for Servo Motor	Cable Side Connector						
		1) Plug (DDK)	2) Connector for conduit				Conduit	
			Type	Manufacturer	Size	Model	Model	ID
HC-SF121B to 301B HC-SF202B to 702B HC-SF203B・353B HC-UF202B to 502B HC-SFS121B to 301B HC-SFS202B to 702B HC-SFS203B・353B HC-SFS2024B to 7024B HC-UFS202B to 502B HC-LFS202B・302B HA-LFS601B to 801B HA-LFS701MB to 15K1MB HA-LFS11K2B to 22K2B HA-LFS6014B to 8014B HA-LFS701M4B to 15K1M4B HA-LFS11K24B to 22K24B	MS3102A10SL-4P	D/MS3106A10SL-4S(D190)	Straight	Nippon flex	1/4	RCC-102RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MSA-10-10	FCV10	10
			Angle	Nippon flex	1/4	RCC-302RL-MS10F	VF-02	8.3
				Daiwa Dengyo	10	MAA-10-10	FCV10	10

3.1.4 HC-AQ series

Servo Motor	Servo Motor Side Connector (Molex)	Cable Side Connector (Molex)	
		Plug	Terminal
HC-AQ□(B)	(Note) 5557-12R-210	5559-12P-210	5558

Note. Terminal: 5556

3.1.5 HC-KFS・HC-MFS・HC-UFS3000r/min series

Use the connectors indicated in this section or equivalent for connection of the power supply, electromagnetic brake and encoder. These connectors may be used for the EN Standard and UL/C-UL Standard but are not waterproof.

(1) For connection of power supply and brake

Servo Motor	Connector Supplied for Servo Motor (Molex)	Cable Side Connector		Manual crimping tool
		Plug (Molex)	Terminal (Molex)	
HC-KFS□ HC-MFS□ HC-UFS13 to 73	5557-04R-210	5559-04P-210	5558PBT3L	57022-5300

Servo Motor	Connector Supplied for Servo Motor (Molex)	Cable Side Connector		Manual crimping tool
		Plug (Molex)	Terminal (Molex)	
HC-KFS□B HC-MFS□ B HC-UFS13 to 73B	5557-06R-210	5559-06P-210	5558PBT3L	57022-5300

(2) For connection of encoder

Servo Motor	Connector Supplied for Servo Motor (Tyco Electronics)	Cable Side Connector		
		Housing (Tyco Electronics)	Connector pin (Tyco Electronics)	Cable clamp (Toa Electric Industry)
HC-KFS□(B) HC-MFS□ (B) HC-UFS13 to 73(B)	1-172169-9	1-172161-9	170359-1 170363-1 (loose piece)	MTI-0002

3.1.6 HC-UF3000r/min series (Compliance with IP65)

Use the connectors indicated in this section or equivalent for connection of the power supply, electromagnetic brake and encoder. These connectors are waterproof.

(1) For connection of power

Servo Motor	Connector Supplied for Servo Motor (Hirose Electric)	Cable Side Connector	
		Plug (Hirose Electric)	Cable clamp (Hirose Electric)
HC-UF□(B)-S1 HC-UFS□(B)-S1	RM15WTP-4P	RM15WTJA-4S	(Note) RM15WTP-CP(8)

Note. The numeral within the parentheses indicates the applicable cable diameter. It depends on the used cable diameter.

(2) For connection of encoder

Servo Motor	Connector Supplied for Servo Motor (Hirose Electric)	Cable Side Connector	
		Plug (With cable clamp) (Hirose Electric)	Cable clamp (Hirose Electric)
HC-UF□(B)-S1 HC-UFS□(B)-S1	RM15WTP-10P	(Note) RM15WTJA-10S-(7)	

Note. The numeral within the parentheses indicates the applicable cable diameter. It depends on the used cable diameter.

(3) For connection of brake

Servo Motor	Connector Supplied for Servo Motor (Hirose Electric)	Cable Side Connector	
		Plug (Hirose Electric)	Cable clamp (Hirose Electric)
HC-UF□B-S1 HC-UFS□B-S1	RM15WTP-4P	RM15WTJA-4S	(Note) RM15WTP-CP(6)

Note. The numeral within the parentheses indicates the applicable cable diameter. It depends on the used cable diameter.

3.2 IP65, EN Standard-compliant options

The following options are available to satisfy the IP65 ingress protection and EN Standard.
To comply with the EN Standard, the power supply connector used must be any of these options or equivalent.

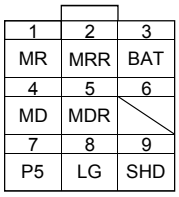
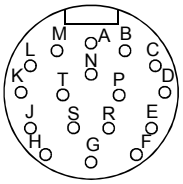
Product	Model	Description		Servo Motor
IP65-compliant encoder cable (For MR-J2 series ・MR-J2-Super Series)	MR-ENCBL□M-H	Servo amplifier side connector (3M or equivalent) Connector: 10120-3000PE Shell kit: 10320-52F0-008	Encoder side connector (DDK) Plug: D/MS3106A20-29S(D190) Cable clamp: CE3057-12A-3-D Back shell: CE02-20BS-S-D	HC-SF series HC-RF series HC-UF2000r/min series HA-LF-UE series HA-FF-UE series HC-SFS series HC-RFS series HC-UFS2000r/min series HA-LFS series HC-LFS series
Encoder cable (For MR-H-□N series)	MR-EN1CBL□M-H	Servo amplifier side connector (Honda Tsushin Kogyo) Connector: PCR-S20FS Case: PCR-LS20LA1	Encoder side connector (DDK) Plug: D/MS3106A20-29S(D190) Cable clamp: CE3057-12A-3-D Back shell: CE02-20BS-S-D	HC-SF series HC-RF series HC-UF2000r/min series HA-LF-UE series
Encoder connector set (For MR-J2 series ・MR-J2-Super Series)	MR-ENCNS	Servo amplifier side connector (3M or equivalent) Connector: 10120-3000PE Shell kit: 10320-52F0-008	Encoder side connector (DDK) Plug: D/MS3106A20-29S(D190) Cable clamp: CE3057-12A-3-D Back shell: CE02-20BS-S-D	HC-SF series HC-RF series HC-UF2000r/min series HC-SFS series HC-RFS series HC-UFS2000r/min series HA-LFS series HC-LFS series
Encoder connector set (For MR-H-□N series)	MR-EN1CNS	Servo amplifier side connector (Honda Tsushin Kogyo) Connector: PCR-S20FS Case: PCR-LS20LA1	Encoder side connector (DDK) Plug: D/MS3106A20-29S(D190) Cable clamp: CE3057-12A-3-D Back shell: CE02-20BS-S-D	HC-SF series HC-RF series HC-UF2000r/min series HA-LF series
EN Standard-compliant power connector set	MR-PWCNF	Plug: CE05-6A14S-2SD-D (DDK) Cable connector: YSO14-9 to 11 (Daiwa Dengyo)		HA-FF□C-UE series

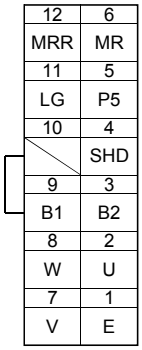
Product	Model	Description	Servo Motor
IP65/EN Standard-compliant power connector set	MR-PWCNS1	 Plug: CE05-6A22-23SD-D-BSS Cable clamp: CE3057-12A-2-D (DDK)	HC-SF81(B) HC-SF52(B) to 152(B) HC-SF53(B) to 153(B) HC-RF103(B) to 203(B) HC-UF72(B) · 152(B) HC-SFS81(B) HC-SFS52(B) to 152(B) HC-SFS53(B) to 153(B) HC-SFS524(B) to 1524(B) HC-RFS103(B) to 203(B) HC-UFS72(B) · 152(B) HC-LFS52(B) to 152(B)
IP65/EN Standard-compliant power connector set	MR-PWCNS2	 Plug: CE05-6A24-10SD-D-BSS Cable clamp: CE3057-16A-2-D (DDK)	HC-SF121(B) to 301(B) HC-SF202(B) to 502(B) HC-SF203(B) · 353(B) HC-RF353(B) · 503(B) HC-UF202(B) to 502(B) HC-SFS121(B) to 301(B) HC-SFS202(B) to 502(B) HC-SFS203(B) · 353(B) HC-SFS2024(B) to 5024(B) HC-RFS353(B) · 503(B) HC-UFS202(B) to 502(B) HA-LFS502 HC-LFS202(B) · 302(B)
Power connector set	MR-PWCNS3	 Plug:CE05-6A32-17SD-D-BSS Cable clamp: CE3057-20A-1-D (DDK)	HC-SF702(B) HC-SFS702(B) HC-SFS7024(B) HA-LFS702
IP65/EN Standard-compliant brake connector set	MR-BKCN (Note)	 Plug: D/MS3106A10SL-4S(D190) (DDK) Cable connector: YSO10-5 to 8 (Daiwa Dengyo)	HA-FF□CB-UE HC-SF121B to 301B HC-SF202B to 702B HC-SF203B · 353B HC-UF202B · 502B HC-SFS121B to 301B HC-SFS202B to 702B HC-SFS203B · 353B HC-SFS2024B to 7024B HC-RFS353B · 503B HC-UFS202B to 502B HC-LFS202B · 302B

Note. If it is used with the HA-FF□C-UE, the servo motor does not improve in ingress protection (IP54).

3.3 Signal arrangement of encoder connectors

The encoder connector of each servo motor has the following signal arrangement. The connectors shown are as seen from the pin side.

<table>
<tr><th>Servo Motor Series</th><th>Signal Arrangement</th></tr>
<tr><td>HC-KF(-UE) series
HC-MF(-UE) series
HA-FF series
HC-UF3000r/min series
HC-KFS series
HC-MFS series
HC-UFS3000r/min series</td><td>Encoder connectors
1-172169-9 (AMP)
 
</td></tr>
<tr><td>HA-FF□C-UE series
HC-SF series
HC-RF series
HC-UF2000r/min series
HA-LH series
HA-LF series
HC-SFS series
HC-RFS series
HC-UFS2000r/min series
HA-LFS series
HC-LFS series</td><td>Encoder connectors
 

<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>A</td><td>MD</td></tr>
<tr><td>B</td><td>MDR</td></tr>
<tr><td>C</td><td>MR</td></tr>
<tr><td>D</td><td>MRR</td></tr>
<tr><td>E</td><td></td></tr>
<tr><td>F</td><td>BAT</td></tr>
<tr><td>G</td><td>LG</td></tr>
<tr><td>H</td><td></td></tr>
<tr><td>J</td><td></td></tr>
</table>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>K</td><td></td></tr>
<tr><td>L</td><td></td></tr>
<tr><td>M</td><td></td></tr>
<tr><td>N</td><td>SHD</td></tr>
<tr><td>P</td><td></td></tr>
<tr><td>R</td><td>LG</td></tr>
<tr><td>S</td><td>P5</td></tr>
<tr><td>T</td><td></td></tr>
</table></td></tr>
<tr><td>HC-AQ series</td><td>Motor connector
 
</td></tr>
</table>

MEMO

4. INSPECTION

⚠ WARNING	・Before starting maintenance and/or inspection, turn off the power and wait for 15 minutes or more until the charge lamp turns off. Then, confirm that the voltage between P and N is safe with a voltage tester and others. Otherwise, an electric shock may occur. In addition, always confirm from the front of the servo amplifier whether the charge lamp is off or not. ・Any person who is involved in inspection should be fully competent to do the work. Otherwise, you may get an electric shock. For repair and parts replacement, contact your safes representative.

POINT
・Do not disassemble and/or repair the equipment on customer side.

(1) Inspection

It is recommended to make the following checks periodically.

(a) Check the servo motor bearings, brake section, etc. for unusual noise.

(b) Check the cables and the like for scratches and cracks. Especially when the junction cable is movable, perform periodic inspection according to operating conditions.

(c) Check the servo motor shaft and coupling for misalignment.

(d) Check the power supply connector and encoder connector tightening screws for looseness.

(2) Life

The following parts must be changed periodically as listed below. If any part is found faulty, it must be changed immediately even when it has not yet reached the end of its life, which depends on the operating method and environmental conditions. For parts replacement, please contact your sales representative.

Part Name	Guideline of Life	Remarks
Bearings	20,000 to 30,000 hours	The Guideline of Life field gives the reference time. If any fault is found before this time is reached, the part must be changed.
Encoder	20,000 to 30,000 hours	
Oil seal	5,000 hours	
Cooling fan	20,000 hours	

(a) Bearings

When the servo motor is run at rated speed under rated load, change the bearings in 20,000 to 30,000 hours as a guideline. This differs on the operating conditions. The bearings must also be changed if unusual noise or vibration is found during inspection.

(b) Oil seal

Must be changed in 5,000 hours of operation at rated speed as a guideline. These parts must also be changed if oil leakage, etc. is found during inspection.

MEMO

5. SPECIFICATIONS

5.1 Standard specifications

Item \ Servo Motor			HC-MF Series (ultra low inertia, small capacity)					HA-FF Series (low inertia, small capacity)					
			053	13	23	43	73	053	13	23	33	43	63
Applicable servo amplifier	MR-H□AN/BN/ACN/TN		20	20	40	60	100	10	10	20	40	40	60
	MR-J2-□A/B/C		10	10	20	40	70	10	10	20	40	40	60
Continuous running duty (Note 1・11)	Rated output	[kW]	0.05	0.1	0.2	0.4	0.75	0.05	0.1	0.2	0.3	0.4	0.6
	Rated torque	[N・m]	0.16	0.32	0.64	1.3	2.4	0.16	0.32	0.64	0.95	1.3	1.9
		[oz・in]	22.7	45.3	90.7	184	340	22.7	45.3	90.7	135	184	269
Rated speed (Note 1)		[r/min]	3000					3000					
Maximum speed		[r/min]	4500					4000					
Instantaneous permissible speed		[r/min]	5175					4600					
Maximum torque		[N・m]	0.48	0.95	1.9	3.8	7.2	0.48	0.95	1.9	2.9	3.8	5.7
		[oz・in]	68.0	135	269	538	1020	68.0	135	269	411	538	808
Power rate at continuous rated torque		[kW/s]	13.47	34.13	46.02	116.55	94.43	4.0	10.2	11.7	18.1	17.2	30.1
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg・m^2]	0.019	0.03	0.088	0.143	0.6	0.063	0.095	0.35	0.50	0.98	1.2
	WK^2	[oz・in^2]	0.104	0.16	0.48	0.78	3.28	0.344	0.52	1.91	2.73	5.36	6.56
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			30 times or less					10 times or less					
Regenerative brake duty [times/min] (Note 4・15)	MR-H series	Servo amplifier's built-in regenerative resistor	(Note 5)	(Note 5)	(Note 5)	4275	1726	(Note 5)	(Note 5)	(Note 5)	1500	750	600
		MR-RB013(10W)	(Note 5)	(Note 5)				2071	1363	370			
		MR-RB033(30W)	(Note 5)	(Note 5)				(Note 5)	4088	1109			
		MR-RB32(300W)			(Note 5)	(Note 5)	(Note 5)				(Note 5)	3983	3046
	MR-J2 series	Servo amplifier' built-in regenerative resistor	(Note 5)	(Note 5)	(Note 5)	1010	400	(Note 5)	(Note 5)	(Note 5)	320	150	120
		MR-RB032(30W)	(Note 5)	(Note 5)	(Note 5)	3000	600	(Note 5)	(Note 5)	(Note 5)	950	450	360
		MR-RB12(100W)			(Note 5)	(Note 5)	2400			(Note 5)	3200	1500	1200
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.										
Rated current		[A]	0.85	0.85	1.5	2.8	5.1	0.6	1.1	1.3	1.9	2.5	3.6
Maximum current		[A]	2.6	2.6	5	9	18	1.8	3.3	3.9	5.7	7.5	10.8
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 8192 pulse/rev)					Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 8192 pulse/rev)					
Accessories								V ring					
Insulation class			Class B					Class B					
Structure			Totally-enclosed, self-cooled (protection type: IP44 (Note 6・12))					Totally-enclosed, self-cooled (protection type: IP44 (Note 8・9・12))					
Environmental conditions (Note 7)			Refer to section 2.1					Refer to section 2.1					
Mass (Note 3)		[kg]	0.4	0.53	0.99	1.45	3.0	1.3	1.5	2.3	2.6	4.2	4.8
		[lb]	0.88	1.17	2.18	3.20	6.61	2.87	3.31	5.07	5.73	9.26	10.6

Item \ Servo Motor			HC-SF 1000r/min Series (middle inertia, middle capacity)				HC-SF 2000r/min Series (middle inertia, middle capacity)						
			81	121	201	301	52	102	152	202	352	502	702
Applicable servo amplifier	MR-H□AN/BN/ACN/TN		100	200	200	350	60	100	200	200	350	500	700
	MR-J2-□A/B/C		100	200	200	350	60	100	200	200	350		
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.85	1.2	2.0	3.0	0.5	1.0	1.5	2.0	3.5	5.0	7.0
	Rated torque	[N · m]	8.12	11.5	19.1	28.6	2.39	4.78	7.16	9.55	16.7	23.9	33.4
		[oz · in]	1151	1630	2707	4053	339	677	1015	1353	2367	3387	4733
Rated speed (Note 1)		[r/min]	1000				2000						
Maximum speed		[r/min]	1500	1200			3000			2500		2000	
Instantaneous permissible speed		[r/min]	1725	1380			3450			2875		2300	
Maximum torque		[N · m]	24.4	34.4	57.3	85.9	7.16	14.4	21.6	28.5	50.1	71.6	100.0
		[oz · in]	3458	4875	8120	12173	1015	2041	3061	4039	7100	10146	14171
Power rate at continuous rated torque		[kW/s]	32.9	30.9	44.5	81.3	8.7	16.7	25.6	21.5	34.1	56.5	69.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	20.0	42.5	82	101	6.6	13.7	20.0	42.5	82.0	101	160
	WK^2	[oz · in^2]	109	232	448	552	36.1	74.9	109	232	448	552	875
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less				15 times or less						
Regenerative brake duty [times/min] (Note 4)	MR-H series	Servo amplifier's built-in regenerative resistor	440	335	174	141	207	170	179	84	43	39	32
		MR-RB31(300W)											57
		MR-RB32(300W)	1649				1241	638					
		MR-RB30(300W)				326					100	90	
		MR-RB34(300W)		774	401				412	193			
		MR-RB50(500W)				543					167	150	
		MR-RB51(500W)											95
		MR-RB54(500W)		1290	669				687	322			
	MR-J2 series	Servo amplifier' built-in regenerative resistor	140	240	100	84	56	54	136	64	31		
		MR-RB032(30W)	220				165	80					
		MR-RB12(100W)	740				560	270					
		MR-RB32(300W)	2220					810					
		MR-RB30(300W)		730	330	250			408	192	95		
		MR-RB50(500W)		1216	550	430			680	320	158		
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.										
Rated current		[A]	5.1	7.1	9.6	16	3.2	6	9	11	17	26	35
Maximum current		[A]	15.3	21.3	28.8	48	9.6	18	27	33	51	84	105
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)				Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)						
Accessories			Oil seal				Oil seal						
Insulation class			Class F				Class F						
Structure			Totally-enclosed, self-cooled (protection type: IP65)				Totally-enclosed, self-cooled (protection type: IP65(Note 12))						
Environmental conditions (Note 7)			Refer to section 2.1				Refer to section 2.1						
Mass (Note 3)		[kg]	9.0	12	19	23	5.0	7.0	9.0	12.0	19.0	23	32
		[lb]	19.8	26.5	41.9	50.7	11.0	15.4	19.8	26.5	41.9	50.7	70.5

Item \ Servo Motor			HC-SF 3000r/min Series (middle inertia, middle capacity)					HC-RF Series (ultra low inertia, middle capacity)				
			53	103	153	203 (Note 13)	353 (Note 13)	103	153	203	353	503
Applicable servo amplifier	MR-H□AN/BN/ACN/TN		60	100	200	200	350	200	200	350	500	500
	MR-J2-□A/B/C		60	100	200	200	350	200	200	350		
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.5	1.0	1.5	2.0	3.5	1.0	1.5	2.0	3.5	5.0
	Rated torque	[N · m]	1.59	3.18	4.78	6.37	11.1	3.18	4.78	6.37	11.1	15.9
		[oz · in]	225	451	677	903	1573	451	677	903	1573	2253
Rated speed (Note 1)		[r/min]	3000					3000				
Maximum speed		[r/min]	3000					4500				
Instantaneous permissible speed		[r/min]	3450					5175				
Maximum torque		[N · m]	4.77	9.55	14.3	19.1	33.4	7.95	11.9	15.9	27.9	39.7
		[oz · in]	676	1353	2026	2707	4733	1127	1686	2253	3954	5626
Power rate at continuous rated torque		[kW/s]	3.8	7.4	11.4	9.5	15.1	67.4	120	176	150	211
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	6.6	13.7	20.0	42.5	82.0	1.5	1.9	2.3	8.6	12.0
	WK^2	[oz · in^2]	36.1	74.9	109.3	232.4	448.3	8.2	10.4	12.6	47.0	65.6
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less					5 times or less				
Regenerative brake duty [times/min] (Note 4)		Servo amplifier's built-in regenerative resistor	92	71	79	37	19	1056	834	689	174	125
	MR-H series	MR-RB32(300W)	552	267								
		MR-RB30(300W)					45			1589	401	288
		MR-RB34(300W)			183	86		2437	1924			
		MR-RB50(500W)					74			2648	669	479
		MR-RB54(500W)			305	143		4061	3206			
	MR-J2 series	Servo amplifier' built-in regenerative resistor	25	24	82	24	14	1090	860	710		
		MR-RB032(30W)	73	36								
		MR-RB12(100W)	250	120								
		MR-RB32(300W)		360								
		MR-RB30(300W)			250	70	42	3270	2580	2130		
		MR-RB50(500W)			410	110	70	5450	4300	3550		
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.									
Rated current		[A]	3.2	5.3	8.6	10.4	16.4	6.1	8.8	14	23	28
Maximum current		[A]	9.6	15.9	25.8	31.2	49.2	18.4	23.4	37	58	70
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)					Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)				
Accessories			Oil seal					Oil seal				
Insulation class			Class F					Class F				
Structure			Totally-enclosed, self-cooled (protection type: IP65)					Totally-enclosed, self-cooled (protection type: IP65(Note 12))				
Environmental conditions (Note 7)			Refer to section 2.1					Refer to section 2.1				
Mass (Note 3)		[kg]	5.0	7.0	9.0	12	19	3.9	5.0	6.2	12.0	17.0
		[lb]	11.0	15.4	19.8	26.5	41.9	8.6	11.0	13.7	26.5	37.5

Item \ Servo Motor			HC-UF 2000r/min Series (flat type・middle capacity)					HC-UF 3000r/min Series (flat type・small capacity)				HA-LH Series (low inertia・large capacity)		
			72	152	202	352	502	13	23	43	73(Note 13)	11K2	15K2	22K2
Applicable servo amplifier	MR-H□AN/BN/ACN/TN		100	200	350	500	500	10	40	60	100	11K	15K	22K
	MR-J2□A/B/C		70	200	350			10	20	40	70			
Continuous running duty (Note 1・11)	Rated output	[kW]	0.75	1.5	2.0	3.5	5.0	0.1	0.2	0.4	0.75	11	15	22
	Rated torque	[N・m]	3.58	7.16	9.55	16.7	23.9	0.32	0.64	1.3	2.4	52.5	71.6	105
		[oz・in]	507	1015	1353	2367	3387	45	91	184	340	7435	10139	14869
Rated speed (Note 1)		[r/min]	2000					3000				2000		
Maximum speed		[r/min]	3000			2500		4500				2000		
Instantaneous permissible speed		[r/min]	3450			2875		5175				2300		
Maximum torque		[N・m]	10.7	21.6	28.5	50.1	71.6	0.95	1.9	3.8	7.2	158	215	263
		[oz・in]	1516	3061	4039	7100	10146	135	269	538	1020	22375	30447	37244
Power rate at continuous rated torque		[kW/s]	12.3	23.2	23.9	36.5	49.6	15.5	19.2	47.7	9.76	235	177	278
Inertia moment (Note 3)	J	[×10^{-4}kg・m^2]	10.4	22.1	38.2	76.5	115	0.066	0.241	0.365	5.90	118	290	395
	WK^2	[oz・in^2]	56.9	120.8	208.9	418.3	628.8	0.4	1.3	2.0	32.3	642.4	1585.6	2159.6
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less									10 times or less		
Regenerative brake duty [times/min] (Note 4・15)	MR-H Series	Servo amplifier's built-in regenerative resistor	211	161	93	44	31	(Note5)	2530	1669	165	85 (Note10)	70 (Note10)	55 (Note10)
		MR-RB013(10W)						2241						
		MR-RB033(30W)						(Note5)						
		MR-RB32(300W)	791						(Note5)	(Note5)	619			
		MR-RB30(300W)			215	102	72							
		MR-RB34(300W)		372										
		MR-RB50(500W)			358	169	119							
		MR-RB54(500W)		620										
		MR-RB65(800W)										130 (Note14)		
		MR-RB66(1300W)											100 (Note14)	
		MR-RB67(1300W)												80 (Note14)
	MR-J2 Series	Servo amplifier' built-in regenerative resistor	53	124	68			(Note5)	(Note5)	410	41			
		MR-RB032(30W)	79					(Note5)	(Note5)	1230	62			
		MR-RB12(100W)	264						(Note5)	4100	206			
		MR-RB30(300W)		372	203									
		MR-RB32(300W)	791								618			
		MR-RB50(500W)		620	338									
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.											
Rated current		[A]	5.4	9.7	14	23	28	0.76	1.5	2.8	4.3	68	87	126
Maximum current		[A]	16.2	29.1	42	69	84	2.5	4.95	9.24	12.9	204	261	315
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)					Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 8192 pulse/rev)				Incremental encoder (Resolution per servo motor 1 rotation: 16384 pulse/rev)		
Cooling fan	Power supply	Voltage, frequency										One-phase 200 to 220VAC 50Hz, One-phase 200 to 230VAC 60Hz		
		Power consumption [W]										42 (50Hz) 54 (60Hz)		
	Rated current	[A]										0.21 (50Hz) 0.25 (60Hz)		
Accessories			Oil seal					Oil seal				Oil seal		
Insulation class			Class F					Class B				Class F		
Structure			Totally-enclosed, self-cooled (protection type: IP65)					Totally-enclosed, self-cooled (protection type: IP65(Note9))				Totally-enclosed, force-cooling (protection type: JP44)		
Environmental conditions (Note 7)			Refer to section 2.1					Refer to section 2.1				Refer to section 2.1		
Mass (Note 3)		[kg]	8.0	11.0	16.0	20.0	24.0	0.8	1.5	1.7	5.0	70	108	135
		[lb]	17.6	24.3	35.3	44.1	52.9	1.8	3.3	3.7	11.0	154.3	238.1	297.6

Item \ Servo Motor			HC-KF Series (low inertia · small capacity)			
			053	13	23	43
Applicable servo amplifier		MR-H□AN/ BN/ACN/TN	10	10	20	40
		MR-J2-□	10A-A16 10B-A16 10C-A16	10A-A15 10B-A15 10C-A15	20A-A15 20B-A15 20C-A15	40A-A15 40B-A15 40C-A15
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.05	0.1	0.2	0.4
	Rated torque	[N · m]	0.16	0.32	0.64	1.3
		[oz · in]	22.7	45.3	90.7	184
Rated speed (Note 1)		[r/min]	3000			
Maximum speed		[r/min]	4500			
Instantaneous permissible speed		[r/min]	5175			
Maximum torque		[N · m]	0.48	0.95	1.9	3.8
		[oz · in]	68.0	135	269	538
Power rate at continuous rated torque		[kW/s]	4.78	12.1	15.8	36.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	0.053	0.084	0.260	0.460
	WK^2	[oz · in^2]	0.29	0.459	1.422	2.515
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less		24 times or less	22 times or less
Regenerative brake duty [times/min] (Note 4 · 15)	MR-H series	Servo amplifier's built-in regenerative resistor	(Note 5)	(Note 5)	(Note 5)	900
		MR-RB013(10W)	3580	2210	350	
		MR-RB033(30W)	(Note 5)	(Note 5)	1050	
		MR-RB32(300W)				(Note 5)
	MR-J2 series	Servo amplifier's built-in regenerative resistor	(Note 5)	(Note 5)	(Note 5)	220
		MR-RB032(30W)	(Note 5)	(Note 5)	(Note 5)	660
		MR-RB12(100W)			(Note 5)	2200
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.			
Rated current		[A]	0.83	0.71	1.1	2.3
Maximum current		[A]	2.5	2.2	3.4	6.9
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 8192 pulses/rev)			
Accessory						
Insulation class			Class B			
Structure			Totally-enclosed, self-cooled (protection type: IP44 (Note 6))			
Environmental conditions (Note 7)			Refer to section 2.1			
Mass		[kg]	0.40	0.53	0.99	1.45
		[lb]	0.882	1.168	2.18	3.20

Item \ Servo Motor			HC-AQ Series (24VDC-compatible · compact size · small capacity)		
			0135	0235	0335
Applicable servo amplifier			MR-J2-03A5 MR-J2-03B5 MR-J2-03C5		
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.01	0.02	0.03
	Rated torque	[N · m]	0.0318	0.0637	0.0955
		[oz · in]	4.503	9.021	13.524
Rated speed (Note 1)		[r/min]	3000		
Maximum speed		[r/min]	5000		4500
Instantaneous permissible speed		[r/min]	5750		5175
Maximum torque		[N · m]	0.0955	0.191	0.287
		[oz · in]	13.524	27.048	40.643
Power rate at continuous rated torque		[kW/s]	2.0	5.6	9.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	0.0050	0.0072	0.0094
	WK^2	[oz · in^2]	0.027	0.039	0.051
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			30 times or less		
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.		
Rated current		[A]	2.4	2.4	2.3
Maximum current		[A]	7.7	7.7	7.4
Speed/position detector			Incremental encoder (Resolution per servo motor 1 rotation: 8192 pulses/rev)		
Accessory					
Insulation class			Class B		
Structure			Totally-enclosed, self-cooled (protection type: IP55 (Note 6))		
Environmental conditions (Note 7)			Refer to section 2.1		
Mass (Note 3)		[kg]	0.19	0.22	0.25
		[lb]	0.419	0.485	0.551

Item \ Servo Motor				HA-LF Series (three-phase, 200VAC-compatible, low inertia · large capacity)	
				30K2	37K2
Applicable servo amplifier			MR-H□AN/BN	30K	37K
Compatible converter unit				MR-HP30KA	
Continuous running duty (Note 1 · 11)	Rated output		[kW]	30	37
	Rated torque		[N · m]	143	177
			[oz · in]	20250.6	25065.4
Rated speed (Note 1)			[r/min]	2000	
Maximum speed			[r/min]	2000	
Instantaneous permissible speed			[r/min]	2300	
Maximum torque			[N · m]	358	442
			[oz · in²]	50697.2	62592.6
Power rate at continuous rated torque			[kW/s]	373	480
Inertia moment	J		[×10⁻⁴kg · m²]	550	650
	WK²		[oz · in²]	3007.1	3553.8
Recommended ratio of load inertia moment to servo motor shaft inertia moment				10 times or less	
Regenerative brake duty [times/min] (Note 4)	MR-RB139 (1300W)			58	49
	MR-RB137 (3900W) (3 units are required.)			174	147
Power supply capacity				Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.	
Rated current			[A]	166	204
Maximum current			[A]	415	510
Speed/position detector				Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulse/rev)	
Cooling fan	Power supply	Voltage · frequency		Three-phase 200 to 220VAC 50Hz, Three-phase 200 to 230VAC 60Hz	
		Power consumption	[W]	45(50Hz)/63(60Hz)	
	Rated current		[A]	0.32(50Hz)/0.35(60Hz)	
Thermal protector		Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A	
		Minimum rated		6VAC/DC, 0.15A	
Accessories				Oil seal	
Insulation class				Class F	
Structure				Totally-enclosed force-cooled (protection type: IP44)	
Environmental conditions (Note 7)				Refer to section 2.1	
Mass (Note 3)			[kg]	160	180
			[lb]	352.7	396.8

Item \ Servo Motor			HA-LF Series (three-phase, 400VAC-compatible, low Inertia, large capacity)			
			30K24	37K24	45K24	55K24
Applicable servo amplifier	MR-H□AN4/BN4		30K	37K	45K	55K
Compatible converter unit			MR-HP55KA4			
Continuous running duty (Note 1 · 11)	Rated output	[kW]	30	37	45	55
	Rated torque	[N · m]	143	177	215	263
		[oz · in]	20250.6	25065.4	30446.6	37244.0
Rated speed (Note 1)		[r/min]	2000			
Maximum speed		[r/min]	2000			
Instantaneous permissible speed		[r/min]	2300			
Maximum torque		[N · m]	358	442	537	657
		[oz · in]	50697.2	62592.6	76045.8	930392
Power rate at continuous rated torque		[kW/s]	373	480	427	526
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	550	650	1080	1310
	WK^2	[oz · in^2]	3007.095	3553.84	5904.84	7162.354
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less			
Regenerative brake duty [times/min] (Note 4)	MR-RB136-4 (1300W)		58	49	30	24
	MR-RB138-4 (3900W) (3 units are required.)		174	147	89	73
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.			
Rated current		[A]	83	102	131	143
Maximum current		[A]	208	255	328	358
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 16384 pulses/rev)			
Cooling fan	Power supply	Voltage · frequency	Three-phase 380 to 460VAC 50/60Hz			
		Power consumption [W]	65(50Hz)/85(60Hz)		110(50Hz)/150(60Hz)	
	Rated current	[A]	0.12(50Hz)/0.14(60Hz)		0.20(50Hz)/0.22(60Hz)	
Thermal protector		Maximum rated	125VAC/DC, 3A or 250VAC/DC, 2A			
		Minimum rated	6VAC/DC, 0.15A			
Accessories			Oil seal			
Insulation class			Class F			
Structure			Totally-enclosed, force-cooled (protection type: IP44)			
Environmental conditions (Note 7)			Refer to section 2.1			
Mass (Note 3)		[kg]	160	180	230	250
		[lb]	352.739	396.832	507.063	551.155

Item \ Servo Motor			HC-MFS Series (ultra low inertia · small capacity)					HC-KFS Series (low inertia · small capacity)				
			053	13	23	43	73	053	13	23	43	73
Applicable servo amplifier/drive unit	MR-J2S-□A/B/CP/CL		10	10	20	40	70	10	10	20	40	70
	MR-J2M-□DU		10	10	20	40	70	10	10	20	40	70
Continuous running duty (Note 1 · 11)	Rated output [kW]		0.05	0.1	0.2	0.4	0.75	0.05	0.1	0.2	0.4	0.75
	Rated torque	[N · m]	0.16	0.32	0.64	1.3	2.4	0.16	0.32	0.64	1.3	2.4
		[oz · in]	22.7	45.3	90.7	184	340	22.7	45.3	90.7	184	340
Rated speed (Note 1)		[r/min]	3000					3000				
Maximum speed		[r/min]	4500					4500				
Instantaneous permissible speed		[r/min]	5175					5175				
Maximum torque		[N · m]	0.48	0.95	1.9	3.8	7.2	0.48	0.95	1.9	3.8	7.2
		[oz · in]	68.0	135	269	538	1020	68.0	135	269	538	1020
Power rate at continuous rated torque		[kW/s]	13.47	34.13	46.02	116.55	94.43	4.78	12.1	15.8	36.7	37.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	0.019	0.03	0.088	0.143	0.6	0.053	0.084	0.260	0.460	1.51
	WK^2	[oz · in^2]	0.104	0.16	0.48	0.78	3.28	0.29	0.459	1.422	2.515	8.26
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			30 times or less					15 times or less		24 times or less	22 times or less	15 times or less
Regenerative brake duty [times/min] (Note 4 · 15)	MR-J2S series	Servo amplifier's built-in regenerative resistor	(Note 5)	(Note 5)	(Note 5)	1010	400	(Note 5)	(Note 5)	(Note 5)	220	190
		MR-RB032(30W)	(Note 5)	(Note 5)	(Note 5)	3000	600	(Note 5)	(Note 5)	(Note 5)	660	280
		MR-RB12(100W)			(Note 5)	(Note5)	2400			(Note 5)	2200	940
		MR-RB32(300W)					(Note5)					2800
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.									
Rated current		[A]	0.85	0.85	1.5	2.8	5.1	0.83	0.71	1.1	2.3	5.8
Maximum current		[A]	2.6	2.6	5	9	18	2.5	2.2	3.4	6.9	18.6
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 131072 pulse/rev)					Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 131072 pulse/rev)				
Accessories												
Insulation class			Class B					Class B				
Structure			Totally-enclosed, self-cooled (protection type: IP55 (Note 6,12))					Totally-enclosed, self-cooled (protection type: IP55 (Note 6,12))				
Environmental conditions (Note 7)			Refer to section 2.1					Refer to section 2.1				
Mass (Note 3)		[kg]	0.4	0.53	0.99	1.45	3.0	0.40	0.53	0.99	1.45	3.0
		[lb]	0.88	1.17	2.18	3.20	6.61	0.882	1.168	2.18	3.20	6.61

Item \ Servo Motor			HC-SFS1000r/min Series (200V-compatible, middle inertia, middle capacity)				HC-SFS 2000r/min Series (200V-compatible, middle inertia, middle capacity)						
			81	121	201	301	52	102	152	202	352	502	702
Applicable servo amplifier/drive unit	MR-J2S-□A/B/CP/CL		100	200	200	350	60	100	200	200	350	500	700
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.85	1.2	2.0	3.0	0.5	1.0	1.5	2.0	3.5	5.0	7.0
	Rated torque	[N · m]	8.12	11.5	19.1	28.6	2.39	4.78	7.16	9.55	16.7	23.9	33.4
		[oz · in]	1151	1630	2707	4053	339	677	1015	1353	2367	3387	4733
Rated speed (Note 1)		[r/min]	1000				2000						
Maximum speed		[r/min]	1500	1200			3000			2500		2000	
Instantaneous permissible speed		[r/min]	1725	1380			3450			2875		2300	
Maximum torque		[N · m]	24.4	34.4	57.3	85.9	7.16	14.4	21.6	28.5	50.1	71.6	100.0
		[oz · in]	3458	4875	8120	12173	1015	2041	3061	4039	7100	10146	14171
Power rate at continuous rated torque		[kW/s]	32.9	30.9	44.5	81.3	8.7	16.7	25.6	21.5	34.1	56.5	69.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	20.0	42.5	82	101	6.6	13.7	20.0	42.5	82.0	101	160
	WK^2	[oz · in^2]	109	232	448	552	36.1	74.9	109	232	448	552	875
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less				15 times or less						
Regenerative brake duty [times/min] (Note 4 · 15)	MR-J2S series	Servo amplifier's built-in regenerative resistor	140	240	100	84	56	54	136	64	31	39	32
		MR-RB032(30W)	220				165	80					
		MR-RB12(100W)	740				560	270					
		MR-RB32(300W)	2220					810					
		MR-RB30(300W)		730	330	250			408	192	95	90	
		MR-RB50(500W)		1216	550	430			680	320	158	150	
		MR-RB31(300W)											57
		MR-RB51(500W)											95
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.										
Rated current		[A]	5.1	7.1	9.6	16	3.2	6	9	11	17	26	35
Maximum current		[A]	15.3	21.3	28.8	48	9.6	18	27	33	51	84	105
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)				Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)						
Accessories			Oil seal				Oil seal						
Insulation class			Class F				Class F						
Structure			Totally-enclosed, self-cooled (protection type: IP65)				Totally-enclosed, self-cooled (protection type: IP65(Note 12))						
Environmental conditions (Note 7)			Refer to section 2.1				Refer to section 2.1						
Mass (Note 3)		[kg]	9.0	12	19	23	5.0	7.0	9.0	12.0	19.0	23	32
		[lb]	19.8	26.5	41.9	50.7	11.0	15.4	19.8	26.5	41.9	50.7	70.5

Item \ Servo Motor			HC-SFS 3000r/min Series (200V-compatible, middle inertia · middle capacity)				
			53	103	153	203	353
Applicable servo amplifier	MR-J2S-□A/B/CP/CL		60	100	200	200	350
Continuous running duty (Note 1 · 11)	Rated output [kW]		0.5	1.0	1.5	2.0	3.5
	Rated torque	[N · m]	1.59	3.18	4.78	6.37	11.1
		[oz · in]	225	451	677	903	1573
Rated speed (Note 1) [r/min]			3000				
Maximum speed [r/min]			3000				
Instantaneous permissible speed [r/min]			3450				
Maximum torque		[N · m]	4.77	9.55	14.3	19.1	33.4
		[oz · in]	676	1353	2026	2707	4733
Power rate at continuous rated torque [kW/s]			3.8	7.4	11.4	9.5	15.1
Inertia moment (Note 3)	J [$\times 10^{-4}$kg · m^2]		6.6	13.7	20.0	42.5	82.0
	WK^2 [oz · in^2]		36.1	74.9	109.3	232.4	448.3
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less				
Regenerative brake duty [times/min] (Note 4 · 15)	MR-J2S series	Servo amplifier's built-in regenerative resistor	25	24	82	24	14
		MR-RB032(30W)	73	36			
		MR-RB12(100W)	250	120			
		MR-RB32(300W)		360			
		MR-RB30(300W)			250	70	42
		MR-RB50(500W)			410	110	70
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.				
Rated current [A]			3.2	5.3	8.6	10.4	16.4
Maximum current [A]			9.6	15.9	25.8	31.2	49.2
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 131072 pulse/rev)				
Accessories			Oil seal				
Insulation class			Class F				
Structure			Totally-enclosed, self-cooled (protection type: IP65)				
Environmental conditions (Note 7)			Refer to section 2.1				
Mass (Note 3)		[kg]	5.0	7.0	9.0	12	19
		[lb]	11.0	15.4	19.8	26.5	41.9

Item \ Servo Motor			HC-SFS Series(400VAC-compatible, middle inertia · middle capacity)						
			524	1024	1524	2024	3524	5024	7024
Applicable servo amplifier	MR-J2S-□A4		60	100	200		350	500	700
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.5	1.0	1.5	2.0	3.5	5.0	7.0
	Rated torque	[N · m]	2.39	4.78	7.16	9.55	16.7	23.9	33.4
		[oz · in]	338.5	676.9	1013.9	1352.4	2364.9	3384.5	4729.9
Rated speed (Note 1)		[r/min]	2000						
Maximum speed		[r/min]	3000			2500		2000	
Instantaneous permissible speed		[r/min]	3450			2875		2300	
Maximum torque		[N · m]	7.16	14.4	21.6	28.5	50.1	71.6	100.0
		[oz · in]	1013.9	2039.2	3058.8	4036	7094.8	10139.4	14161.2
Power rate at continuous rated torque		[kW/s]	8.7	16.7	25.6	21.5	34.1	56.5	69.7
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	6.6	13.7	20.0	42.5	82.0	101	160
	WK^2	[oz · in^2]	36.1	74.9	109.3	232.4	448.3	552.2	874.8
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note2)			15 times or less						
Regenerative brake duty [times/min] (Note 4)	MR-J2S Series	Servo amplifier's built-in regenerative resistor	56	54	136	64	31	39	32
		MR-RB1L-4(100W)	560						
		MR-RB3M-4(300W)		810					
		MR-RB3H-4(300W)			408	192			
		MR-RB5H-4(500W)			680	320			
		MR-RB3G-4(300W)					95	90	
		MR-RB5G-4(500W)					158	150	
		MR-RB34-4(300W)							57
		MR-RB54-4(500W)							95
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.						
Rated current		[A]	1.5	2.8	4.4	5.4	8.6	14	17
Maximum current		[A]	4.5	8.4	13.2	16.2	25.8	42	51
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)						
Accessories			Oil seal						
Insulation class			Class F						
Structure			Totally-enclosed, self-cooled(protection type: IP65 (Note 12))						
Environmental conditions (Note 7)			Refer to section 2.1						
Mass (Note 3)		[kg]	5.0	7.0	9.0	12.0	19.0	23	32
		[lb]	11	15.4	19.8	26.5	41.9	50.7	70.5

Item \ Servo Motor			HC-RFS Series (ultra low inertia · middle capacity)				
			103	153	203	353	503
Applicable servo amplifier	MR-J2S-□A/B/CP/CL		200	200	350	500	500
Continuous running duty (Note 1 · 11)	Rated output	[kW]	1.0	1.5	2.0	3.5	5.0
	Rated torque	[N · m]	3.18	4.78	6.37	11.1	15.9
		[oz · in]	450	677	902	1572	2252
Rated speed (Note 1)		[r/min]	3000				
Maximum speed		[r/min]	4500				
Instantaneous permissible speed		[r/min]	5175				
Maximum torque		[N · m]	7.95	11.9	15.9	27.9	39.7
		[oz · in]	1126	1686	2253	3954	5626
Power rate at continuous rated torque		[kW/s]	67.4	120	176	150	211
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	1.5	1.9	2.3	8.6	12.0
	WK^2	[oz · in^2]	8.2	10.4	12.6	47.0	65.6
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			5 times or less				
Regenerative brake duty [times/min] (Note 4)	MR-J2S series	Servo amplifier's built-in regenerative resistor	1090	860	710	174	125
		MR-RB30(300W)	3270	2580	2130	401	288
		MR-RB50(500W)	5450	4300	3550	669	479
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.				
Rated current		[A]	6.1	8.8	14	23	28
Maximum current		[A]	18.4	23.4	37	58	70
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)				
Accessories			Oil seal				
Insulation class			Class F				
Structure			Totally-enclosed, self-cooled (protection type: IP65 (Note 12))				
Environmental conditions (Note 7)			Refer to section 2.1				
Mass (Note 3)		[kg]	3.9	5.0	6.2	12.0	17.0
		[lb]	8.6	11.0	13.7	26.5	37.5

Item \ Servo Motor			HC-UFS 2000r/min Series (flat type ・ middle capacity)					HC-UFS 3000r/min Series (flat type ・ small capacity)			
			72	152	202	352	502	13	23	43	73
Applicable servo amplifier/drive unit	MR-J2S□A/B/CP/CL		70	200	350	500	500	10	20	40	70
	MR-J2M□DU							10	20	40	70
Continuous running duty (Note 1・11)	Rated output	[kW]	0.75	1.5	2.0	3.5	5.0	0.1	0.2	0.4	0.75
	Rated torque	[N・m]	3.58	7.16	9.55	16.7	23.9	0.32	0.64	1.3	2.4
		[oz・in]	507	1015	1353	2367	3387	45	91	184	340
Rated speed (Note 1)		[r/min]	2000					3000			
Maximum speed		[r/min]	3000			2500		4500			
Instantaneous permissible speed		[r/min]	3450			2875		5175			
Maximum torque		[N・m]	10.7	21.6	28.5	50.1	71.6	0.95	1.9	3.8	7.2
		[oz・in]	1516	3061	4039	7100	10146	135	269	538	1020
Power rate at continuous rated torque		[kW/s]	12.3	23.2	23.9	36.5	49.6	15.5	19.2	47.7	9.76
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg・m^2]	10.4	22.1	38.2	76.5	115	0.066	0.241	0.365	5.90
	WK^2	[oz・in^2]	56.9	120.8	208.9	418.3	628.8	0.4	1.3	2.0	32.3
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			15 times or less					15 times or less			
Regenerative brake duty [times/min] (Note 4・15)	MR-J2S Series	Servo amplifier's built-in regenerative resistor	53	124	68	44	31	(Note5)	(Note5)	410	41
		MR-RB032(30W)	79					(Note5)	(Note5)	1230	62
		MR-RB12(100W)	264						(Note5)	4100	206
		MR-RB30(300W)		372	203	102	72				
		MR-RB32(300W)	791								618
		MR-RB50(500W)		620	338	169	119				
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.								
Rated current		[A]	5.4	9.7	14	23	28	0.76	1.5	2.8	4.3
Maximum current		[A]	16.2	29.1	42	69	84	2.5	4.95	9.24	12.9
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 131072 pulse/rev)					Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation : 131072 pulse/rev)			
Accessories			Oil seal					Oil seal			
Insulation class			Class F					Class B			
Structure			Totally-enclosed, self-cooled (protection type: IP65)					Totally-enclosed, self-cooled (protection type: IP65(Note9))			
Environmental conditions (Note 7)			Refer to section 2.1					Refer to section 2.1			
Mass (Note 3)		[kg]	8.0	11.0	16.0	20.0	24.0	0.8	1.5	1.7	5.0
		[lb]	17.6	24.3	35.3	44.1	52.9	1.8	3.3	3.7	11.0

Item \ Servo Motor			HA-LFS 1000r/min Series (200VAC-compatible, low inertia · middle large capacity)							
			601 (Note 13)	801	12K1	15K1	20K1	25K1	30K1	37K1
Applicable servo amplifier	MR-J2S-□A/B		700A-U058 700B-U058 700CP-U058 700CL-U058	11KA 11KB		15KA 15KB	22KA 22KB		30KA 30KB	37KA-U039 37KB-U039
Compatible converter unit									MR-HP30KA	
Continuous running duty (Note 1 · 11)	Rated output	[kW]	6	8	12	15	20	25	30	37 (75% ED)
	Rated torque	[N · m]	57.3	76.4	115	143	191	239	286	353
		[oz · in]	8114	10819	16285	20251	27048	33845	40501	49989
Rated speed (Note 1)		[r/min]	1000							
Maximum speed		[r/min]	1200							
Instantaneous permissible speed		[r/min]	1380							
Maximum torque		[N · m]	172	229	344	415	477	597	716	883
		[oz · in]	24357	32429	48715	58769	67549	84542	101394	125044
Power rate at continuous rated torque		[kW/s]	313	265	445	373	561	528	626	668
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	105	220	295	550	650	1080	1310	1870
	WK^2	[oz · in^2]	574.1	1202.8	1612.9	3007.1	3553.8	5904.8	7162.4	10224.1
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less							
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's built-in regenerative resistor		158	354 (Note 10 · 14)	264 (Note 10 · 14)	230 (Note 10 · 14)	195 (Note 10 · 14)	117 (Note 10 · 14)		
	MR-RB31(300W)		278							
	MR-RB51(500W)		464							
	MR-RB65(800W)			354 (Note 14)	264 (Note 14)					
	MR-RB66(1300W)					230 (Note 14)				
	MR-RB67(1300W)						195 (Note 14)	117 (Note 14)		
	MR-RB139(1300W)								97	68
	MR-RB137(3900W)								290	203
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.							
Rated current		[A]	34	42	61	83	118	118	154	188
Maximum current		[A]	102	126	183	249	295	295	385	470
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)							
Cooling fan	Power supply	Voltage · frequency	Three-phase 200 to 220 VAC 50Hz, One-phase 200 to 230 VAC 60Hz	Three-phase 200 to 230VAC 50Hz/60Hz						
		Power consumption [W]	42(50Hz)/ 54(60Hz)	62(50Hz)/ 76(60Hz)		65(50Hz)/ 85(60Hz)		120(50Hz)/ 175(60Hz)		
	Rated current	[A]	0.21(50Hz)/ 0.25(60Hz)	0.18(50Hz)/ 0.17(60Hz)		0.20(50Hz)/ 0.22(60Hz)		0.65(50Hz)/ 0.80(60Hz)		
Thermal protector	Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A							
	Minimum rated		6VAC/DC, 0.15A							
Accessories			Oil seal							
Insulation class			Class F							
Structure			Totally-enclosed, force-cooled (protection type: IP44)							
Environmental conditions (Note 7)			Refer to section 2.1							
Mass (Note 3)		[kg]	55	95	115	160	180	230	250	335
		[lb]	121.3	209.4	253.5	352.7	396.8	507.1	551.6	738.5

Item \ Servo Motor			HA-LFS 1500r/min Series (200VAC-compatible, low inertia · middle large capacity)					
			701M (Note 13)	11K1M	15K1M	22K1M	30K1M	37K1M
Applicable servo amplifier	MR-J2S-□		700A-U058 700B-U058 700CP-U059 700CL-U059	11KA 11KB	15KA 15KB	22KA 22KB	30KA 30KB	37KA-U042 37KB-U042
Compatible converter unit							MR-HP30KA	
Continuous running duty (Note 1 · 11)	Rated output	[kW]	7	11	15	22	30	37 (75% ED)
	Rated torque	[N · m]	44.6	70.0	95.5	140	191	236
		[oz · in]	6315.9	9912.9	13524	19825.7	27047.9	33420.5
Rated speed (Note 1)		[r/min]	1500					
Maximum speed		[r/min]	2000					
Instantaneous permissible speed		[r/min]	2300					
Maximum torque		[N · m]	134	210	286	350	477	589
		[oz · in]	18976	29738.6	40501.1	49564.3	67549.1	83409.6
Power rate at continuous rated torque		[kW/s]	189	223	309	357	561	514
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	105	220	295	550	650	1080
	WK^2	[oz · in^2]	574.1	1202.8	1612.9	3007.1	3553.8	5904.8
Recommended ratio if load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less					
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's built-in regenerative resistor		70	158 (Note 10 · 14)	191 (Note 10 · 14)	102 (Note 10 · 14)		
	MR-RB31(300W)		124					
	MR-RB51(500W)		206					
	MR-RB65(800W)			158 (Note 14)				
	MR-RB66(1300W)				191 (Note 14)			
	MR-RB67(1300W)					102 (Note 14)		
	MR-RB139(1300W)						87	52
	MR-RB137(3900W)						260	156
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.					
Rated current		[A]	37	65	87	126	174	202
Maximum current		[A]	111	195	261	315	435	505
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)					
cooling fan	Power supply	Voltage · frequency	One-phase 200 to 220 VAC 50Hz, One-phase 200 to 230 VAC 60Hz	Three-phase 200 to 230VAC 50Hz/60Hz				
		Power consumption [W]	42(50Hz)/ 54(60Hz)	62(50Hz)/ 76(60Hz)		65(50Hz)/ 85(60Hz)		120(50Hz)/ 175(60Hz)
	Rated current	[A]	0.21(50Hz)/ 0.25(60Hz)	0.18(50Hz)/ 0.17(60Hz)		0.20(50Hz)/ 0.22(60Hz)		0.65(50Hz)/ 0.80(60Hz)
Thermal protector	Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A					
	Minimum rated		6VAC/DC, 0.15A					
Accessories			Oil seal					
Insulation class			Class F					
Structure			Totally-enclosed, force-cooled (protection type: IP44)					
Environmental conditions (Note 7)			Refer to section 2.1					
Mass (Note 3)		[kg]	55	95	115	160	180	230
		[lb]	121.3	209.4	253.5	352.7	396.8	507.1

Item \ Servo Motor			HA-LFS 2000r/min Series (200VAC-compatible, low inertia · middle large capacity)						
			502 (Note 13)	702 (Note 13)	11K2	15K2	22K2	30K2	37K2
Applicable servo amplifier	MR-J2S-□		500A 500B 500CP 500CL	700A 700B 700CP 700CL	11KA 11KB	15KA 15KB	22KA 22KB	30KA 30KB	37KA 37KB
Compatible converter unit								MR-HP30KA	
Continuous running duty (Note 1 · 11)	Rated output	[kW]	5.0	7.0	11	15	22	30	37 (75% ED)
	Rated torque	[N · m]	23.9	33.4	52.5	71.6	105	143	177
		[oz · in]	3384.5	4729.9	7434.6	10139.4	14869.3	20250.6	25065.4
Rated speed (Note 1)		[r/min]	2000						
Maximum speed		[r/min]	2000						
Instantaneous permissible speed		[r/min]	2300						
Maximum torque		[N · m]	71.6	100	158	215	263	358	442
		[oz · in]	10139.4	14161.2	22374.7	30446.6	37244	50697.2	62592.6
Power rate at continuous rated torque		[kW/s]	77.2	118	263	233	374	373	480
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	74.0	94.2	105	220	295	550	650
	WK^2	[oz · in^2]	404.6	515	574.1	1202.8	1612.9	3007.1	3553.8
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less						
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's built-in regenerative resistor		50	50	186 (Note 10 · 14)	144 (Note 10 · 14)	107 (Note 10 · 14)		
	MR-RB30(300W)		120						
	MR-RB31(300W)			95					
	MR-RB50(500W)		200						
	MR-RB51(500W)			160					
	MR-RB65(800W)				186(Note 14)				
	MR-RB66(1300W)					144(Note 14)			
	MR-RB67(1300W)						107(Note 14)		
	MR-RB139(1300W)							58	49
	MR-RB137(3900W)							174	147
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.						
Rated current		[A]	25	34	63	77	112	166	204
Maximum current		[A]	75	102	189	231	280	415	510
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)						
Cooling fan	Power supply	Voltage · frequency			One-phase 200 to 220 VAC 50Hz, One-phase 200 to 230 VAC 60Hz	Three-phase 200 to 230VAC 50Hz/60Hz			
		Power consumption [W]			42(50Hz)/ 54(60Hz)	62(50Hz)/ 76(60Hz)		65(50Hz)/ 85(60Hz)	
	Rated current	[A]			0.21(50Hz)/ 0.25(60Hz)	0.18(50Hz)/ 0.17(60Hz)		0.20(50Hz)/ 0.22(60Hz)	
Thermal protector	Maximum rated				125VAC/DC, 3A or 250VAC/DC, 2A				
	Minimum rated				6VAC/DC, 0.15A				
Accessories			Oil seal						
Insulation class			Class F						
Structure			Totally-enclosed, self-cooled (protection: IP65)		Totally-enclosed, force-cooled (protection: IP44)				
Environmental conditions (Note 7)			Refer to section 2.1						
Mass (Note 3)		[kg]	28	35	55	95	115	160	180
		[lb]	61.7	77.2	121.3	209.4	253.5	352.7	396.8

Item \ Servo Motor			HA-LFS 1000r/min Series (400VAC-compatible, low inertia · large capacity)							
			6014	8014	12K14	15K14	20K14	25K14	30K14	37K14
Applicable servo amplifier	MR-J2S-□		700A4-U071 700B4-U071	11KA4 11KB4	11KA4 11KB4	15KA4 15KB4	22KA4 22KB4	30KA4 30KB4	30KA4 30KB4	37KA4 37KB4
Compatible converter unit								MR-HP55KA4		
Continuous running duty (Note 1 · 11)	Rated output	[kW]	6	8	12	15	20	25	30	37
	Rated torque	[N · m]	57.3	76.4	115	143	191	239	286	353
		[oz · in]	8114.4	10819.1	16285.4	20250.56	27047.95	33845.34	40501.11	49989.14
Rated speed (Note 1)		[r/min]	1000							
Maximum speed		[r/min]	1200							
Instantaneous permissible speed		[r/min]	1380							
Maximum torque		[N · m]	172	229	344	415	477	597	716	883
		[oz · in]	24357.3	32429.21	48714.63	58769.1	67549.06	84542.54	101394.4	125043.65
Power rate at continuous rated torque		[kW/s]	313	265	445	373	561	528	626	668
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	105	220	295	550	650	1080	1310	1870
	WK^2	[oz · in^2]	574.1	1202.8	1612.9	3007.1	3553.8	5904.8	7162.4	10224.1
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less							
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's supplied regenerative resistor		158	354 (Note 10 · 14)	264 (Note 10 · 14)	230 (Note 10 · 14)	195 (Note 10 · 14)			
	MR-RB34-4(300W)		278							
	MR-RB54-4(500W)		464							
	MR-RB6B-4(800W)			354 (Note 14)	264 (Note 14)					
	MR-RB60-4(1300W)					230 (Note 14)				
	MR-RB6K-4(1300W)						195 (Note 14)			
	MR-RB136-4(1300W)							118	97	68
	MR-RB138-4(3900W)							354	290	203
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.							
Rated current		[A]	17	20	30	40	55	70	77	95
Maximum current		[A]	51	63	93	126	148	175	193	235
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)							
Cooling fan	Power supply	Voltage · frequency	One-phase 200 to 220VAC/ 50Hz, One-phase 200 to 230VAC/ 60Hz	Three-phase 380 to 440VAC 50Hz Three-phase 380 to 480VAC 60Hz	Three-phase 380 to 460VAC 50Hz Three-phase 380 to 480VAC 60Hz					
		Power consumption [W]	42 (50Hz)/ 54 (60Hz)	62 (50Hz)/ 76 (60Hz)	65 (50Hz)/ 85 (60Hz)			110 (50Hz)/ 150 (60Hz)		
	Rated current	[A]	0.21 (50Hz)/ 0.25 (60Hz)	0.14 (50Hz)/ 0.11 (60Hz)	0.12 (50Hz)/ 0.14 (60Hz)			0.20 (50Hz)/ 0.22 (60Hz)		
Thermal protector	Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A							
	Minimum rated		6VAC/DC, 0.15A							
Accessories			Oil seal							
Insulation class			Class F							
Structure			Totally-enclosed, force-cooled (protection: IP44)							
Environmental conditions (Note 7)			Refer to section 2.1							
Mass (Note 3)		[kg]	55	95	115	160	180	230	250	335
		[lb]	121.3	209.4	209.43	352.7	396.8	507	551.2	738.5

Item \ Servo Motor			HA-LFS 1500r/min Series (400VAC-compatible, low inertia · large capacity)							
			701M4	11K1M4	15K1M4	22K1M4	30K1M4	37K1M4	45K1M4	50K1M4
Applicable servo amplifier	MR-J2S-□		700A4-U073 700B4-U073	11KA4 11KB4	15KA4 15KB4	22KA4 22KB4	30KA4 30KB4	37KA4 37KB4	45KA4 45KB4	55KA4 55KB4
Compatible converter unit							MR-HP55KA4			
Continuous running duty (Note 1 · 11)	Rated output	[kW]	7	11	15	22	30	37	45	50
	Rated torque	[N · m]	44.6	70.0	95.5	140	191	236	286	318
		[oz · in]	6315.9	9912.86	13523.97	19825.72	27047.95	33420.5	40501.11	45032.71
Rated speed (Note 1)		[r/min]	1500							
Maximum speed		[r/min]	2000							
Instantaneous permissible speed		[r/min]	2300							
Maximum torque		[N · m]	134	210	286	350	477	589	716	796
		[oz · in]	18976	29738.6	40501.1	49564.3	67549.1	83409.6	101394.3	112723.4
Power rate at continuous rated torque		[kW/s]	189	223	309	357	561	514	626	542
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	105	220	295	550	650	1080	1310	1870
	WK^2	[oz · in^2]	574.1	1202.8	1612.9	3007.1	3553.8	5904.8	7162.4	10224.1
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less							
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's supplied regenerative resistor		70	158 (Note 10 · 14)	191 (Note 10 · 14)	102 (Note 10 · 14)				
	MR-RB34-4(300W)		124							
	MR-RB54-4(500W)		206							
	MR-RB6B-4(800W)		124	158 (Note 14)						
	MR-RB60-4(1300W)		206		191 (Note 14)					
	MR-RB6K-4(1300W)					102 (Note 14)				
	MR-RB136-4(1300W)						87	52	43	30
	MR-RB138-4(3900W)						260	156	129	90
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.							
Rated current		[A]	18	31	41	63	87	101	128	143
Maximum current		[A]	54	99	132	158	218	253	320	358
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)							
Cooling fan	Power supply	Voltage · frequency	One-phase 200 to 220VAC/ 50Hz, One-phase 200 to 230VAC/ 60Hz	Three-phase 380 to 440VAC 50Hz Three-phase 380 to 480VAC 60Hz		Three-phase 380 to 460VAC 50Hz Three-phase 380 to 480VAC 60Hz				
		Power consumption [W]	42 (50Hz)/ 54 (60Hz)	62 (50Hz)/ 76 (60Hz)		65 (50Hz)/ 85 (60Hz)		110 (50Hz)/ 150 (60Hz)		
	Rated current	[A]	0.21 (50Hz)/ 0.25 (60Hz)	0.14 (50Hz)/ 0.11 (60Hz)		0.12 (50Hz)/ 0.14 (60Hz)		0.20 (50Hz)/ 0.22 (60Hz)		
Thermal protector	Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A							
	Minimum rated		6VAC/DC, 0.15A							
Accessories			Oil seal							
Insulation class			Class F							
Structure			Totally-enclosed, force-cooled (protection: IP44)							
Environmental conditions (Note 7)			Refer to section 2.1							
Mass (Note 3)		[kg]	55	95	115	160	180	230	250	335
		[lb]	121.3	209.4	253.5	352.7	396.8	507.1	551.2	738.5

Item \ Servo Motor			HA-LFS 2000r/min Series (400VAC-compatible, low inertia · large capacity)						
			11K24	15K24	22K24	30K24	37K24	45K24	55K24
Applicable servo amplifier	MR-J2S-□A4/B4		11K	15K	22K	30K	37K	45K	55K
Compatible converter unit						MR-HP55KA4			
Continuous running duty (Note 1 · 11)	Rated output	[kW]	11	15	22	30	37	45	55
	Rated torque	[N · m]	52.5	71.6	105	143	177	215	263
		[oz · in]	7434.6	10139.4	14869.3	20250.6	25065.4	30446.6	37244
Rated speed (Note 1)		[r/min]	2000						
Maximum speed		[r/min]	2000						
Instantaneous permissible speed		[r/min]	2300						
Maximum torque		[N · m]	158	215	263	358	442	537	657
		[oz · in]	22374.7	30446.6	37244	506972	62592.6	76045.8	93039.3
Power rate at continuous rated torque		[kW/s]	263	233	374	373	480	427	526
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	105	220	295	550	650	1080	1310
	WK^2	[oz · in^2]	574.1	1202.8	1612.9	3007.1	3553.8	5904.8	7162.4
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less						
Regenerative brake duty [times/min] (Note 4)	Servo amplifier's supplied regenerative resistor		186 (Note 10 · 14)	144 (Note 10 · 14)	107 (Note 10 · 14)				
	MR-RB6B-4(800W)		186 (Note14)						
	MR-RB60-4(1300W)			144(Note 14)					
	MR-RB6K-4(1300W)				107(Note 14)				
	MR-RB136-4(1300W)					58	49	30	24
	MR-RB138-4(3900W)					174	147	89	73
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.						
Rated current		[A]	32	40	57	83	102	131	143
Maximum current		[A]	96	120	171	208	255	328	358
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)						
Cooling fan	Power supply	Voltage · frequency	One-phase 200 to 220VAC/50Hz, One-phase 200 to 230VAC/60Hz	Three-phase 380 to 440VAC 50Hz Three-phase 380 to 480VAC 60Hz		Three-phase 380 to 460VAC 50Hz Three-phase 380 to 480VAC 60Hz			
		Power consumption [W]	42 (50Hz)/ 54 (60 Hz)	62 (50Hz)/ 76 (60Hz)		65 (50Hz)/ 85 (60Hz)		110 (50Hz)/ 150 (60Hz)	
	Rated current	[A]	0.21 (50Hz)/ 0.25 (60 Hz)	0.14 (50Hz)/ 0.11 (60Hz)		0.12 (50Hz)/ 0.14 (60Hz)		0.20 (50Hz)/ 0.22 (60Hz)	
Thermal protector	Maximum rated		125VAC/DC, 3A or 250VAC/DC, 2A						
	Minimum rated		6VAC/DC, 0.15A						
Accessories			Absolute · Encoder, oil seal						
Insulation class			Class F						
Structure			Totally-enclosed, force-cooled (protection: IP44)						
Environmental conditions (Note 7)			Refer to section 2.1						
Mass (Note 3)		[kg]	55	95	115	160	180	230	250
		[lb]	121.3	209.4	253.5	352.7	396.8	507.1	551.2

Item \ Servo Motor			HC-LFS Series (low inertia · middle capacity)				
			52	102	152	202	302
Applicable servo amplifier	MR-J2S-□A/B/CP/CL		60	100	200	350	500
Continuous running duty (Note 1 · 11)	Rated output	[kW]	0.5	1.0	1.5	2.0	3.0
	Rated torque	[N · m]	2.39	4.78	7.16	9.55	14.3
		[oz · in]	338.5	676.9	1013.9	1352.4	2025.1
Rated speed (Note 1)		[r/min]	2000				
Maximum speed		[r/min]	3000				
Instantaneous permissible speed		[r/min]	3450				
Maximum torque		[N · m]	7.16	14.4	21.6	28.5	42.9
		[oz · in]	1013.9	2039.2	3058.8	4036	6075.2
Power rate at continuous rated torque		[kW/s]	17.9	49.7	80.1	41.5	56.8
Inertia moment (Note 3)	J	[$\times 10^{-4}$kg · m^2]	3.2	4.6	6.4	22	36
	WK^2	[oz · in^2]	17.5	25.2	35	120.3	196.8
Recommended ratio of load inertia moment to servo motor shaft inertia moment (Note 2)			10 times or less				
Regenerative brake duty [times/min] (Note 4 · 15)	Servo amplifier' built-in regenerative resistor		115	160	425	120	70
	MR-RB032(30W)		340	235			
	MR-RB12(100W)		1150	800			
	MR-RB30(300W)				1270	370	215
	MR-RB32(300W)			2410			
	MR-RB50(500W)				2120	615	355
Power supply capacity			Refer to "Power supply equipment capacity and generated loss of servo amplifiers" in Servo Amplifier Instruction Manual.				
Rated current		[A]	3.2	5.9	9.9	14	23
Maximum current		[A]	9.6	18	30	42	69
Speed/position detector			Encoder common to absolute position and incremental detection systems (Resolution per servo motor 1 rotation: 131072 pulse/rev)				
Accessories			Oil seal				
Insulation class			Class F				
Structure			Totally-enclosed, self-cooled (protection type: IP65)				
Environmental conditions (Note 7)			Refer to section 2.1				
Mass (Note 3)		[kg]	6.5	8.0	10.0	21	28
		[lb]	14.33	17.6	22	46.3	61.7

Note 1.When the power supply voltage drops, we cannot guarantee the output and rated speed.

2.If the load inertia moment ratio exceeds the indicated value, please consult us.

3.This ratio is the load inertia moment ratio to the inertia moment of the servo motor. If the load inertia moment ratio exceeds the indicated value, please consult us. When the servo motor is equipped with reduction gear or electromagnetic brake, refer to the corresponding outline dimension drawing. For the EN Standard- and UL/C-UL Standard-compliant models, please consult us.

4.The regenerative brake duty indicated is the permissible duty when the servo motor running without load at the rated speed is decelerated to a stop. When a load is connected, the value in the table is multiplied by 1/(m + 1), where m = load inertia moment/motor inertia moment. At the speed higher than the rated, the permissible number of times is in inverse proportion to the square of (running speed/rated speed). When the running speed varies frequently or when the regenerative mode continues as in vertical feed, calculate regenerative heat generated during operation. Provisions must be made to keep this generated heat below the permissible value.

5.If the effective torque is within the rated torque range, there are no restrictions on the regenerative duty.

6.Except for the shaft-through portion and connector end.

7.In the environment where the servo motor is exposed to oil mist, oil and/or water, the servo motor of the standard specifications may not be usable. Contact us.

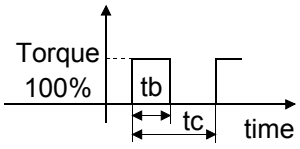
8.IP54 for the EN Standard-compliant model.

9.Except the connector section.

10.Values for use of the supplied regenerative brake unit (regenerative resistor) are indicated in the case of the 11k to 22kW servo amplifiers. Values for use of the supplied regenerative brake unit (regenerative resistor).

11.80%ED at low noise.

80%ED: Indicates the condition in which operation time at read torque accounts for 80% and the other no-load time accounts for 20% in a single operation cycle.



$tb < 60$ sec. (continuous operation time)

$$\%ED = \frac{tb}{tc} \times 100$$

12.When the servo motor is provided with the reduction gear, the protection type of the reduction gear section is IP44.

13.Consult us since they may not be connected depending on the production period of the servo amplifier.

14.Value applicable when the regenerative option is cooled by a cooling fan.

15.The regenerative brake duty of the 600W or less servo amplifier may vary under the influence of the power supply voltage because of the large ratio of the energy for charging the electrolytic capacitor in the servo amplifier.

5.2 Torque characteristics

POINT

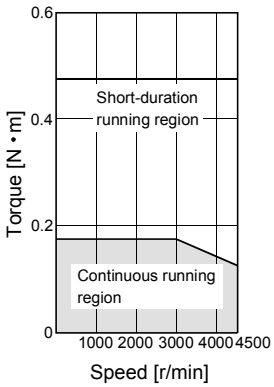
- For machines which produce unbalance torque, e.g. vertical lift applications, it is recommended to use the servo motor so that the unbalance torque will be within 70% of the rated torque.
- The torque characteristics without notes assume that the power supply is three-phase 200VAC.

(1) HC-MF series

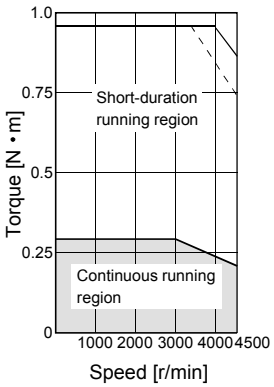
POINT

- The continuous broken line in the graph assumes that the servo motor is used with the servo amplifier of single-phase 100VAC power supply specifications.

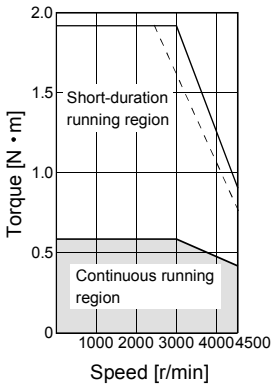
[HC-MF053]



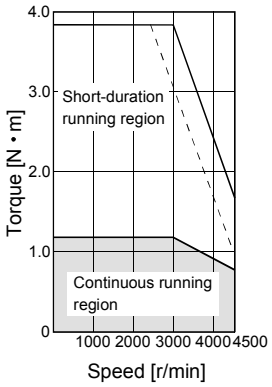
[HC-MF13]



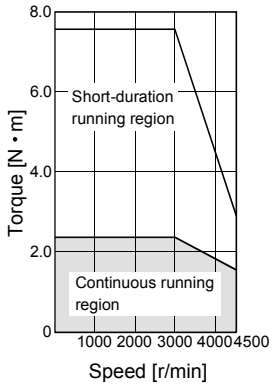
[HC-MF23]



[HC-MF43]



[HC-MF73]

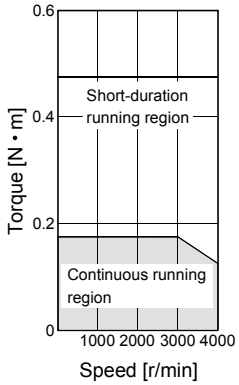


(2) HA-FF series

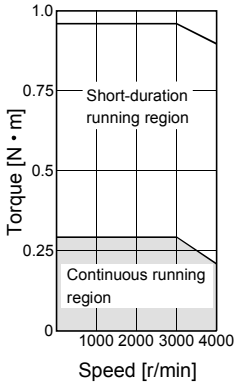
POINT

・The continuous broken line in the graph assumes that the servo motor is used with the servo amplifier of single-phase 100VAC power supply specifications.

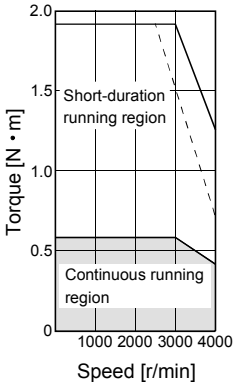
[HA-FF053]



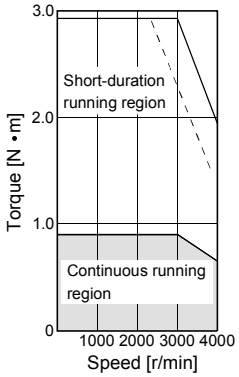
[HA-FF13]



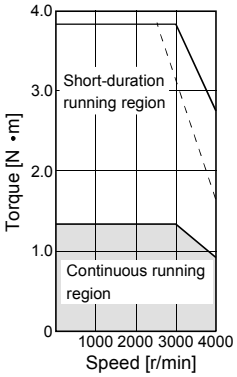
[HA-FF23]



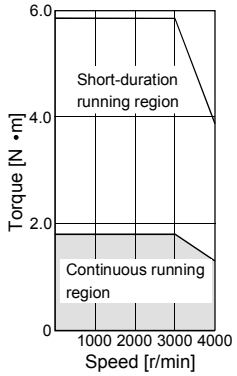
[HA-FF33]



[HA-FF43]



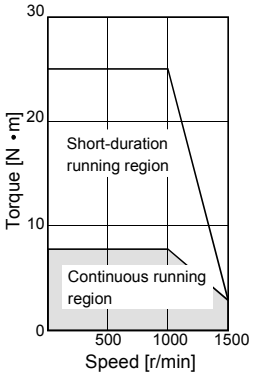
[HA-FF63]



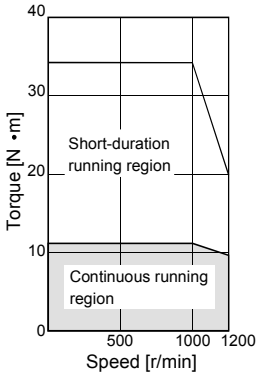
(3) HC-SF/HC-SFS series

(a) 200VAC-compatible

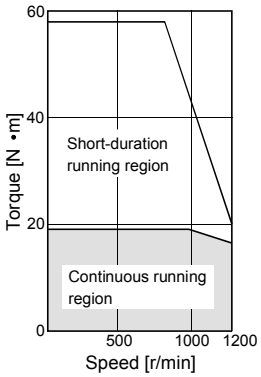
[HC-SF81] (Note 1)
[HC-SFS81] (Note 1)



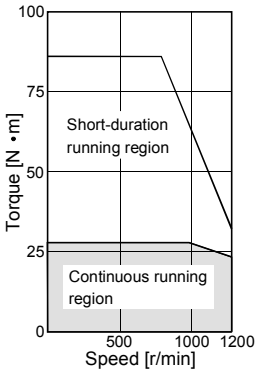
[HC-SF121] (Note 1)
[HC-SFS121] (Note 1)



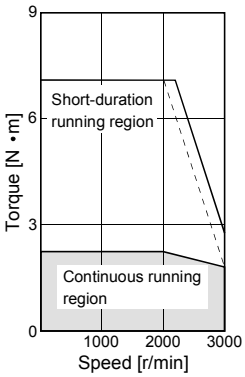
[HC-SF201] (Note 1)
[HC-SFS201] (Note 1)



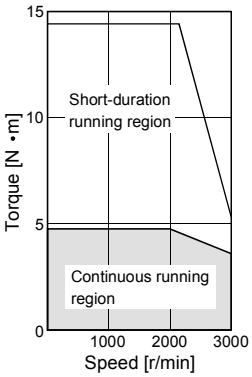
[HC-SF301] (Note 1)
[HC-SFS301] (Note 1)



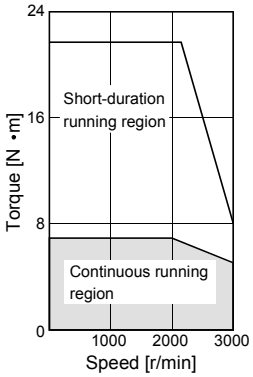
[HC-SF52] (Note 1, 2)
[HC-SFS52] (Note 1, 2)



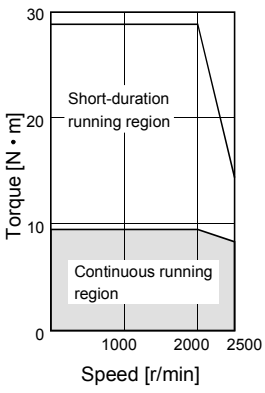
[HC-SF102] (Note 1)
[HC-SFS102] (Note 1)



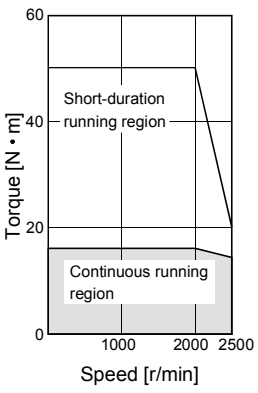
[HC-SF152] (Note 1)
[HC-SFS152] (Note 1)



[HC-SF202] (Note 1)
[HC-SFS202] (Note 1)

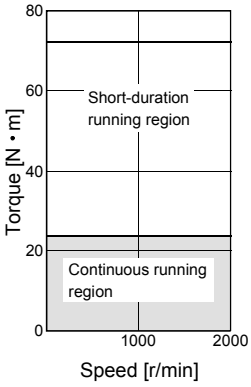


[HC-SF352] (Note 1)
[HC-SFS352] (Note 1)

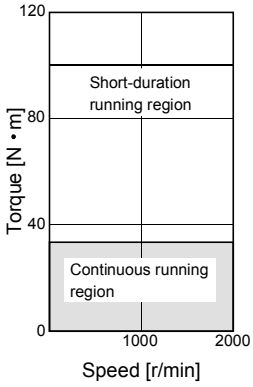


Note 1. The continuous line assumes that the servo amplifier's main circuit power supply is 3-phase 200VAC.
2. The broken line assumes that the servo amplifier's main circuit power supply is 1-phase 230VAC.
Note that only the area different from 3-phase 200VAC is indicated by the broken line.

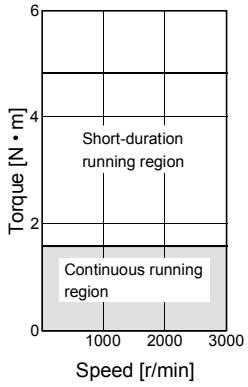
[HC-SF502]
[HC-SFS502]



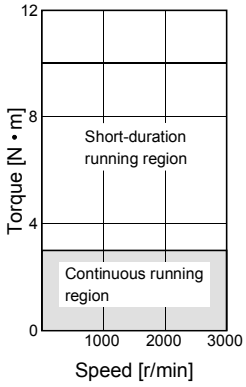
[HC-SF702]
[HC-SFS702]



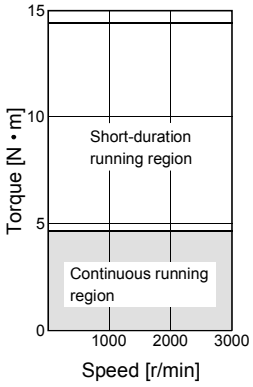
[HC-SF53]
[HC-SFS53]



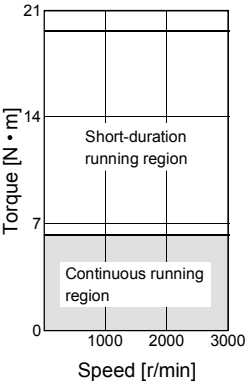
[HC-SF103]
[HC-SFS103]



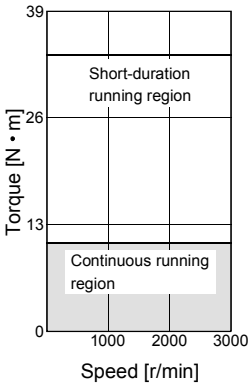
[HC-SF153]
[HC-SFS153]



[HC-SF203]
[HC-SFS203]

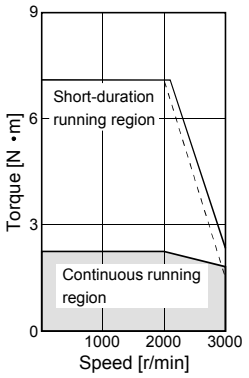


[HC-SF353]
[HC-SFS353]

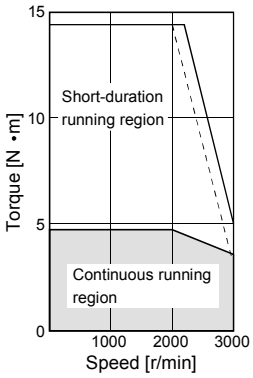


(b) 400VAC-compatible

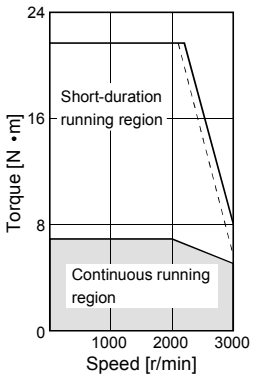
[HC-SFS524] (Note 1, 2)



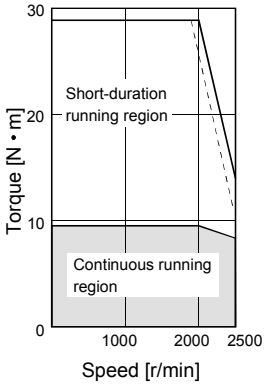
[HC-SFS1024] (Note 1, 2)



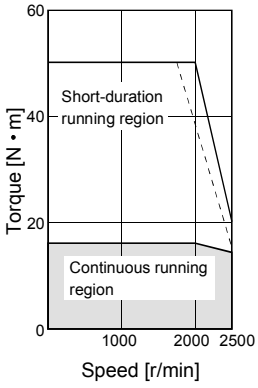
[HC-SFS1524] (Note 1, 2)



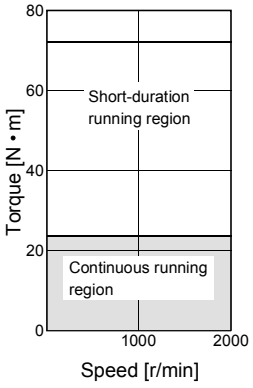
[HC-SFS2024] (Note 1, 2)



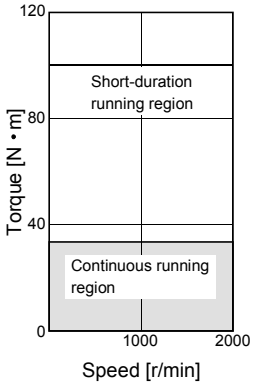
[HC-SFS3524] (Note 1, 2)



[HC-SFS5024] (Note 1)



[HC-SFS7024] (Note 1)

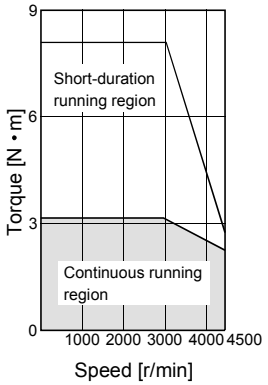


Note 1. The continuous line assumes that the servo amplifier's main circuit power supply is 3-phase 400VAC.

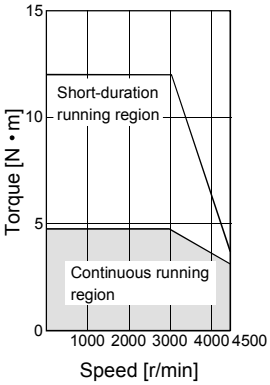
2. The broken line assumes that the servo amplifier's main circuit power supply is 3-phase 380VAC.
Note that only the area different from 3-phase 400VAC is indicated by the broken line.

(4) HC-RF/HC-RFS series

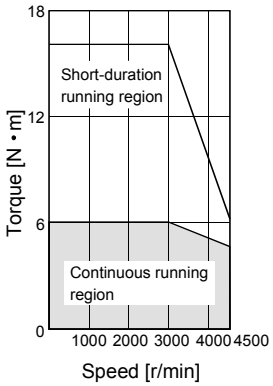
[HC-RF103]
[HC-RFS103]



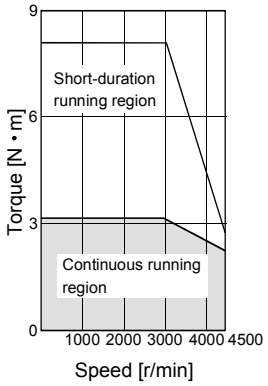
[HC-RF153]
[HC-RFS153]



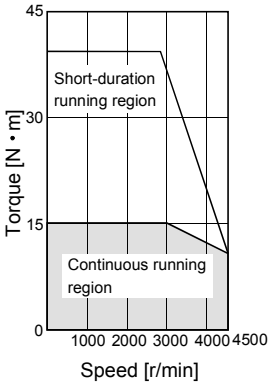
[HC-RF203]
[HC-RFS203]



[HC-RF353]
[HC-RFS353]



[HC-RF503]
[HC-RFS503]

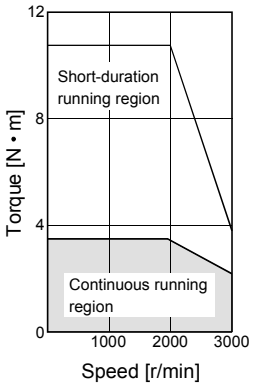


(5) HC-UF/HC-UFS series

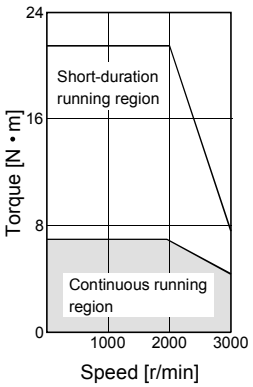
POINT

- The continuous broken line in the graph assumes that the servo motor is used with the servo amplifier of single-phase 100VAC power supply specifications.

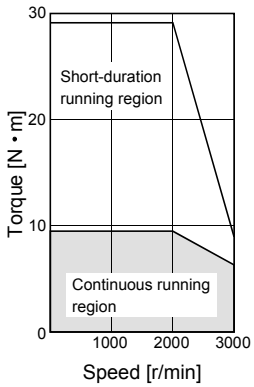
[HC-UF72]
[HC-UFS72]



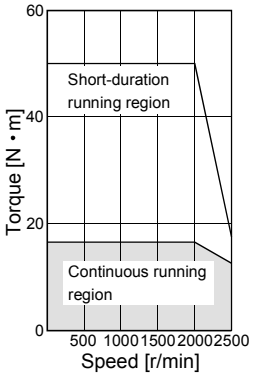
[HC-UF152]
[HC-UFS152]



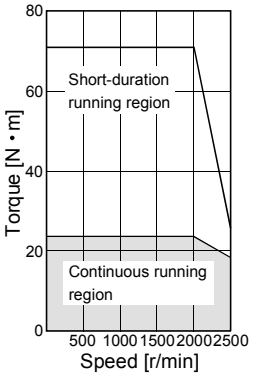
[HC-UF202]
[HC-UFS202]



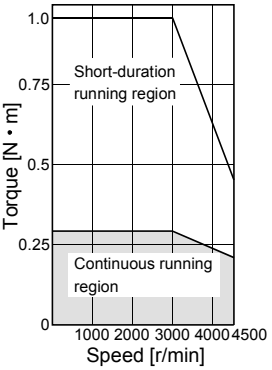
[HC-UF352]
[HC-UFS352]



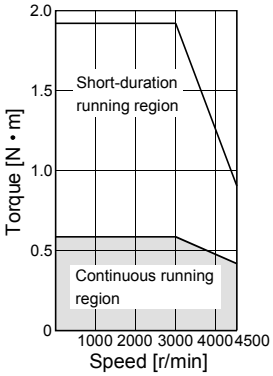
[HC-UF502]
[HC-UFS502]



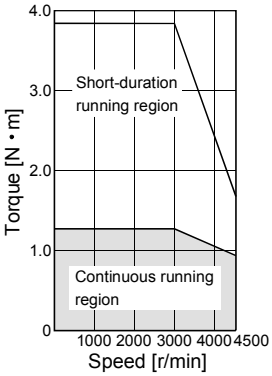
[HC-UF13]



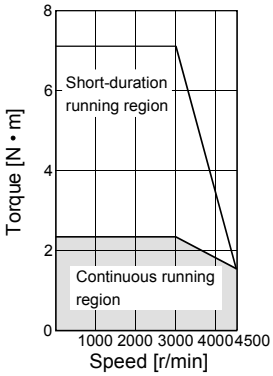
[HC-UF23]



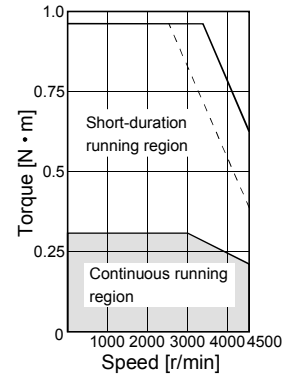
[HC-UF43]



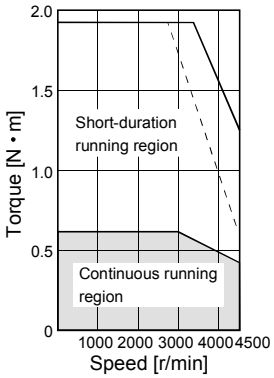
[HC-UF73]



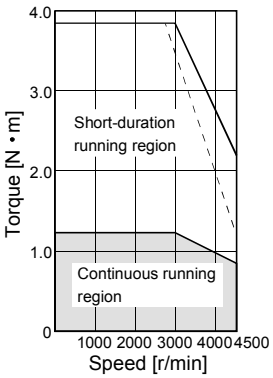
[HC-UFS13]



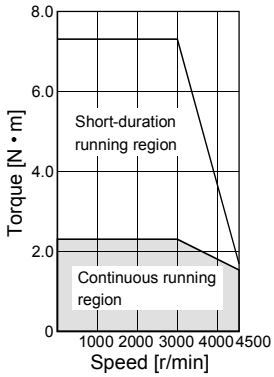
[HC-UFS23]



[HC-UFS43]

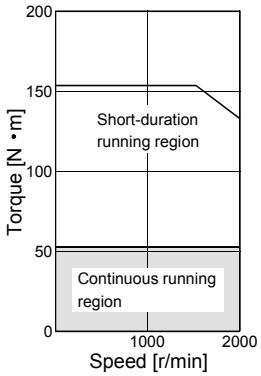


[HC-UFS73]

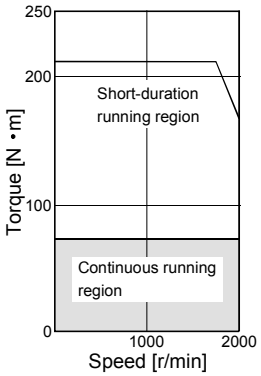


(6) HA-LH series

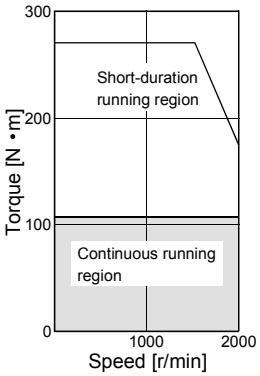
[HA-LH11K2]



[HA-LH15K2]

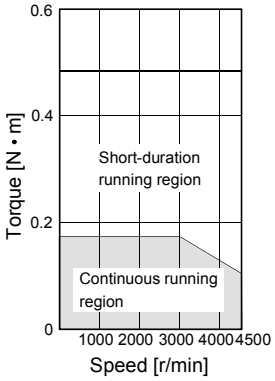


[HA-LH22K2]

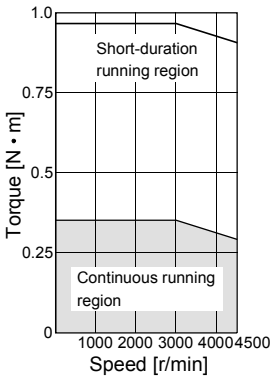


(7) HC-KF series

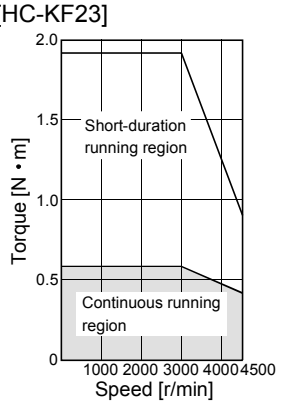
[HC-KF053]



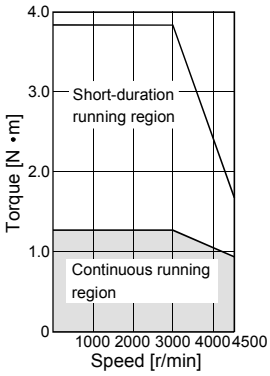
[HC-KF13]



[HC-KF23]

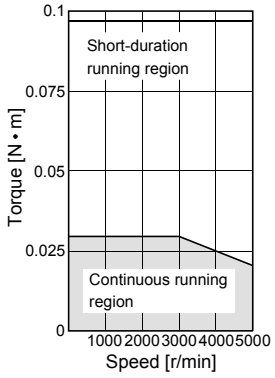


[HC-KF43]

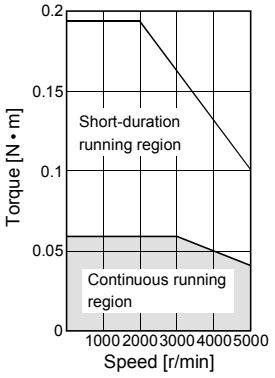


(8) HC-AQ series

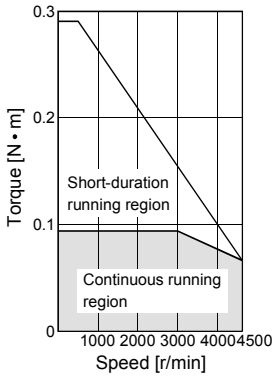
[HC-AQ0135] (Note)



[HC-AQ0235] (Note)



[HC-AQ0335] (Note)

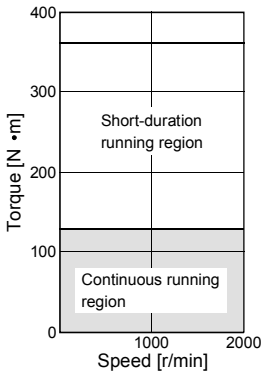


Note. Assumes that the servo amplifier main circuit power supply is 24 VDC.

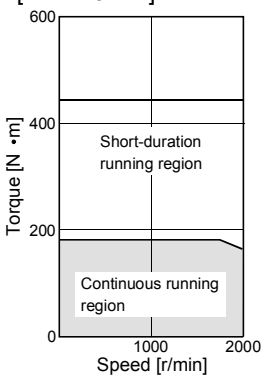
(9) HA-LF series

(a) 200VAC-compatible

[HA-LF30K2]

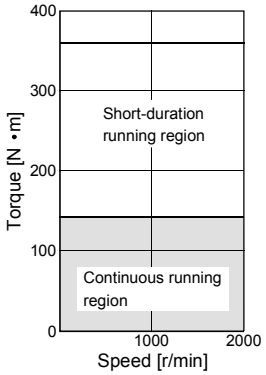


[HA-LF37K2]

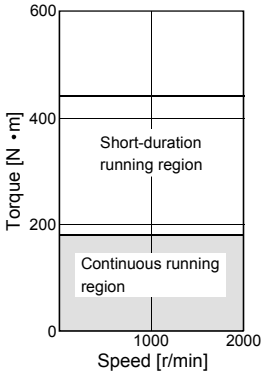


(b) 400VAC-compatible

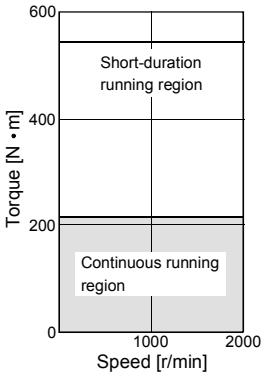
[HA-LF30K24] (Note)



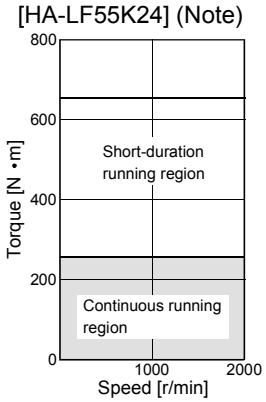
[HA-LF37K24] (Note)



[HA-LF45K24] (Note)



[HA-LF55K24] (Note)

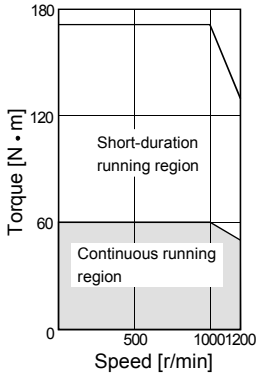


Note. Assumes that the servo amplifier main circuit power supply is three-phase 400 VAC.

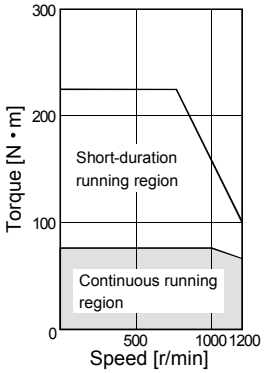
(10) HA-LFS series

(a) 200VAC-compatible

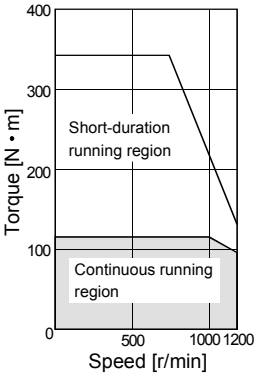
[HA-LFS601]



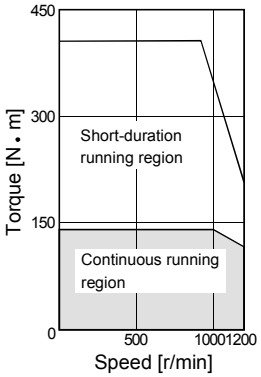
[HA-LFS801]



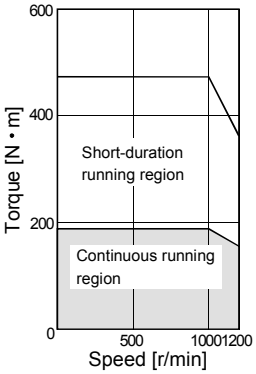
[HA-LFS12K1]



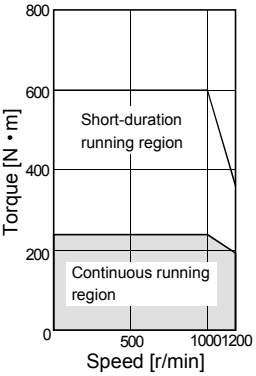
[HA-LFS15K1]



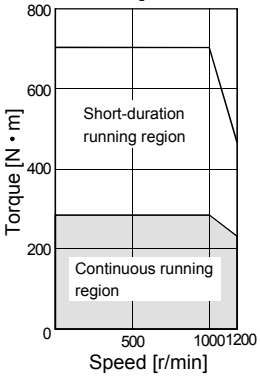
[HA-LFS20K1]



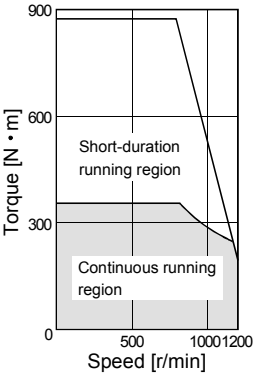
[HA-LFS25K1]



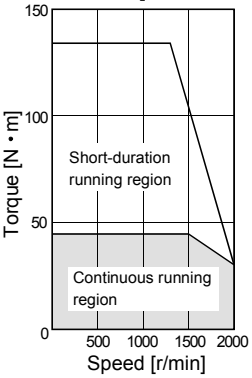
[HA-LFS30K1]



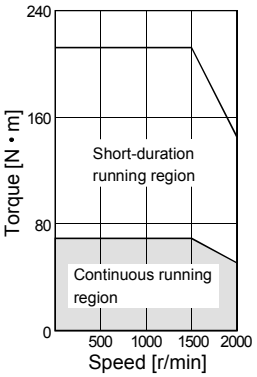
[HA-LFS37K1]



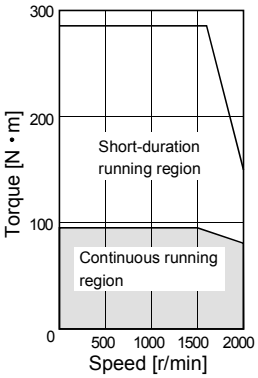
[HA-LFS701M]



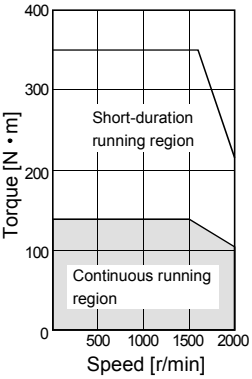
[HA-LFS11K1M]



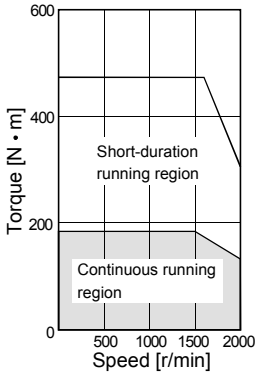
[HA-LFS15K1M]



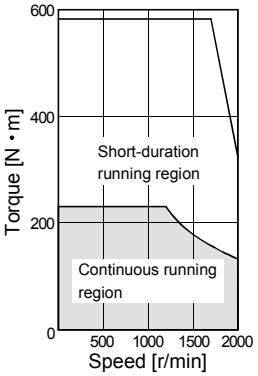
[HA-LFS22K1M]



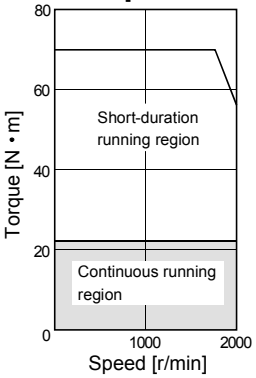
[HA-LFS30K1M]



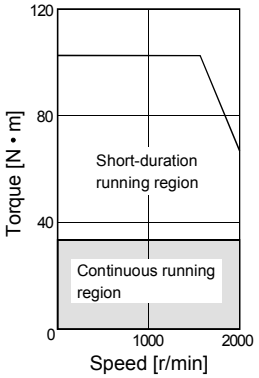
[HA-LFS37K1M]



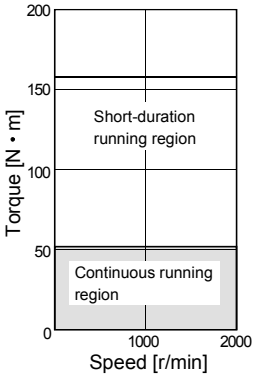
[HA-LFS502]



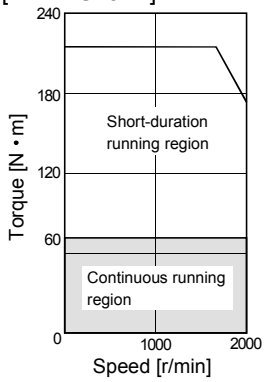
[HA-LFS702]



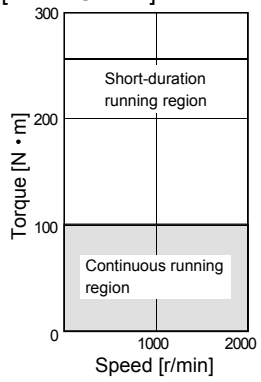
[HA-LFS11K2]



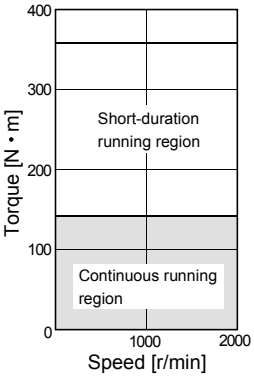
[HA-LFS15K2]



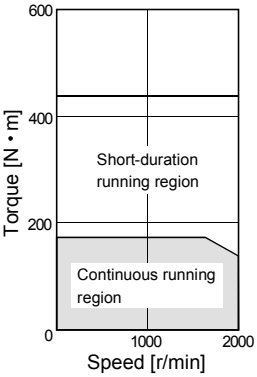
[HA-LFS22K2]



[HA-LFS30K2]

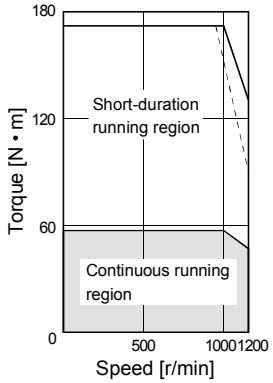


[HA-LFS37K2]

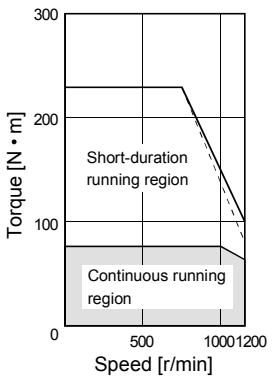


(b) 400VAC-compatible (Note 1)

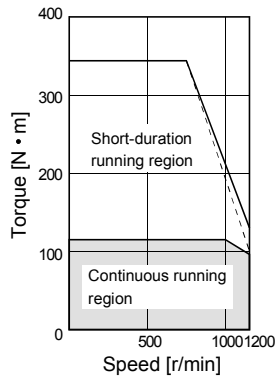
[HA-LFS6014 (B)] (Note 1, 2)



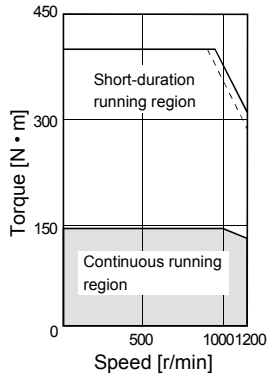
[HA-LFS8014 (B)] (Note 1, 2)



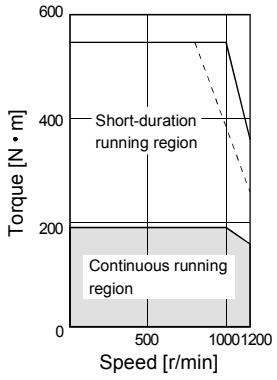
[HA-LFS12K14 (B)] (Note 1, 2)



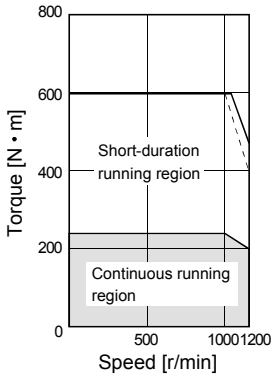
[HA-LFS15K14] (Note 1, 2)



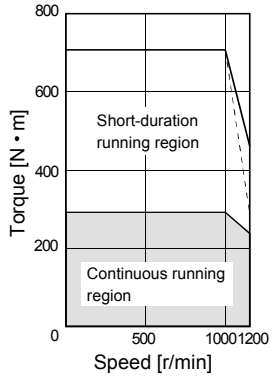
[HA-LFS20K14] (Note 1, 2)



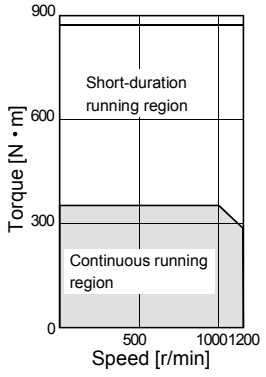
[HA-LFS25K14] (Note 1, 2)



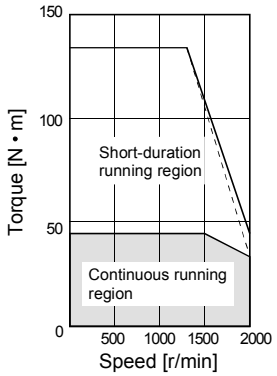
[HA-LFS30K14] (Note 1, 2)



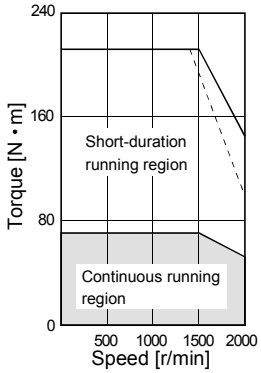
[HA-LFS37K14] (Note 1)



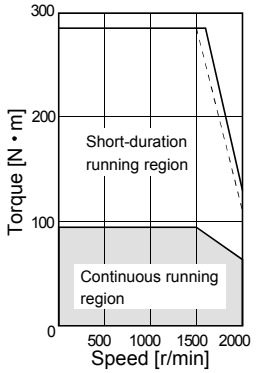
[HA-LFS701M4 (B)] (Note 1, 2)



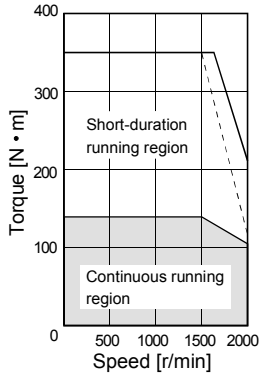
[HA-LFS11K1M4] (Note 1, 2)



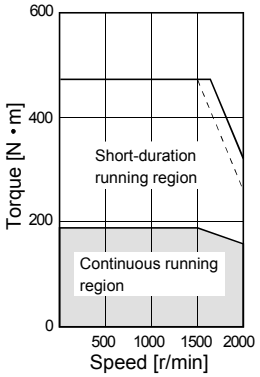
[HA-LFS15K1M4] (Note 1, 2)



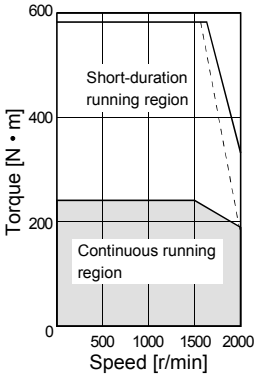
[HA-LFS22K1M4] (Note 1, 2)



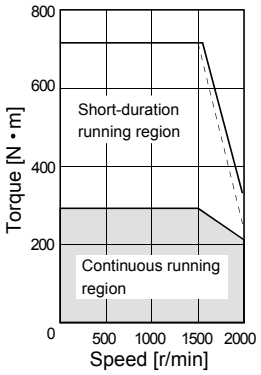
[HA-LFS30K1M4] (Note 1, 2)



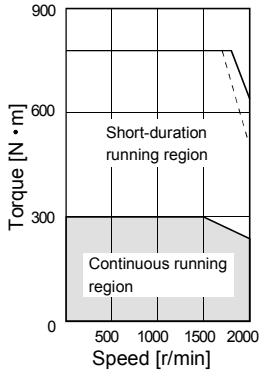
[HA-LFS37K1M4] (Note 1, 2)



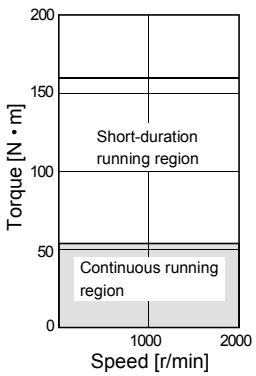
[HA-LFS45K1M4] (Note 1, 2)



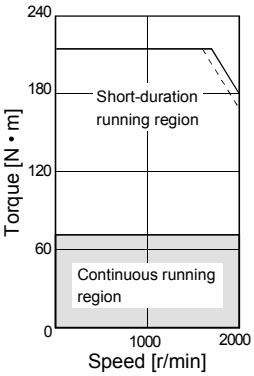
[HA-LFS50K1M4] (Note 1, 2)



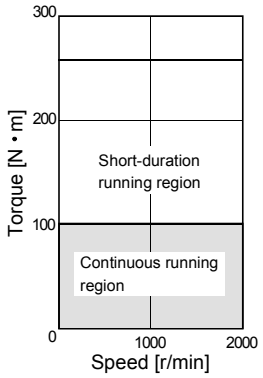
[HA-LFS11K24] (Note 1)



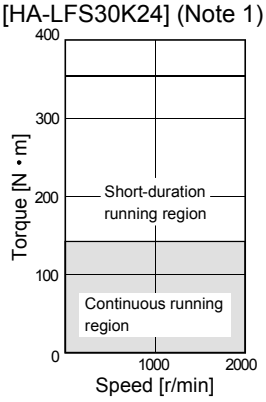
[HA-LFS15K24] (Note 1, 2)



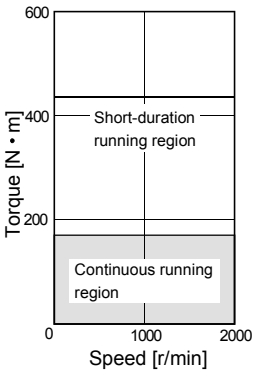
[HA-LFS22K24] (Note 1)



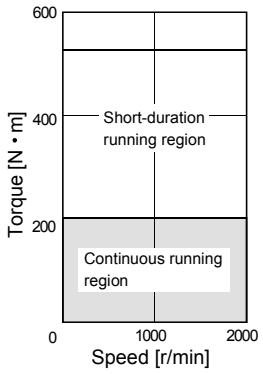
[HA-LFS30K24] (Note 1)



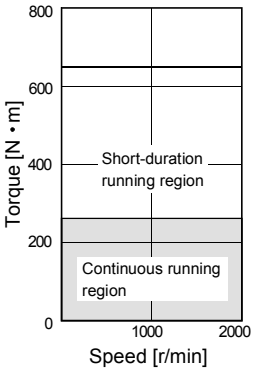
[HA-LFS37K24] (Note 1)



[HA-LFS45K24] (Note 1)



[HA-LFS55K24] (Note 1)



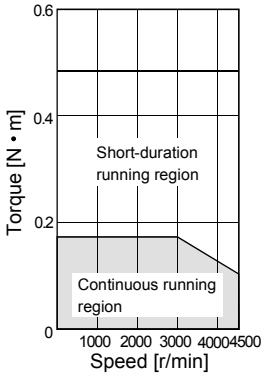
Note 1. The continuous line assumes that the servo amplifier's main circuit power supply is 3-phase 400VAC.
2. The broken line assumes that the servo amplifier's main circuit power supply is 1-phase 230VAC.
Note that only the area different from 3-phase 200VAC is indicated by the broken line.

(11) HC-MFS series

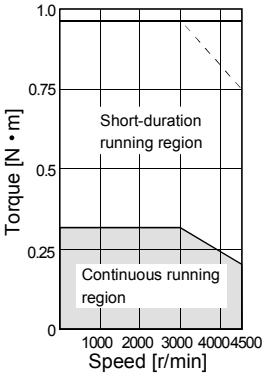
POINT

- The continuous broken line in the graph assumes that the servo motor is used with the servo amplifier of single-phase 100VAC power supply specifications.

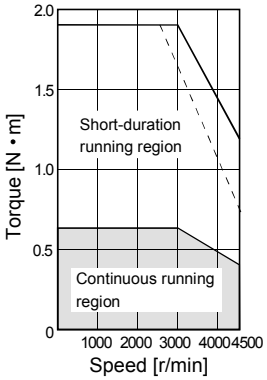
[HC-MFS053]



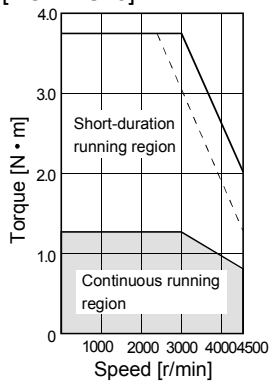
[HC-MFS13]



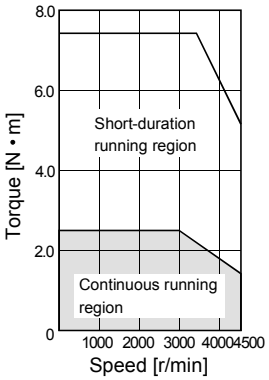
[HC-MFS23]



[HC-MFS43]



[HC-MFS73]

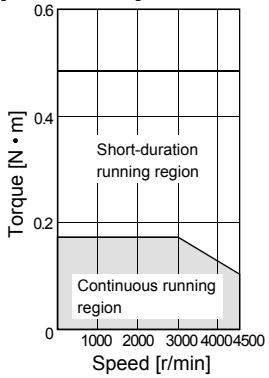


(12) HC-KFS series

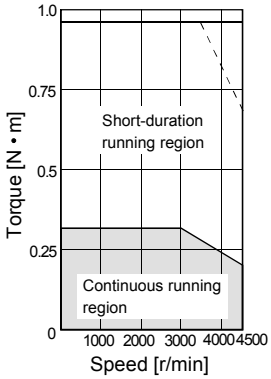
POINT

- The continuous broken line in the graph assumes that the servo motor is used with the servo amplifier of single-phase 100VAC power supply specifications.

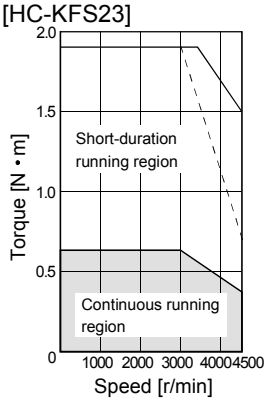
[HC-KFS053]



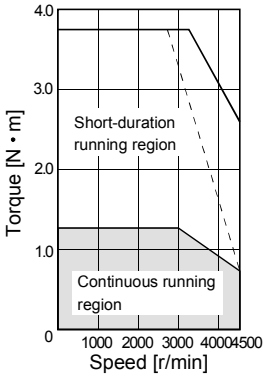
[HC-KFS13]



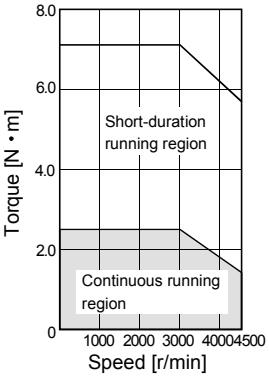
[HC-KFS23]



[HC-KFS43]

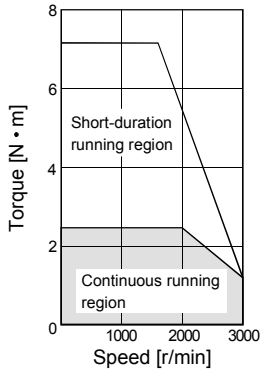


[HC-KFS73]

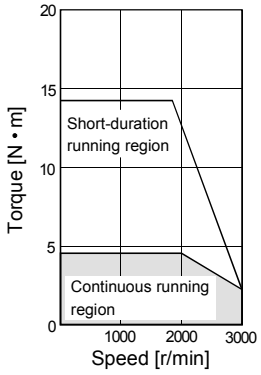


(13) HC-LFS series

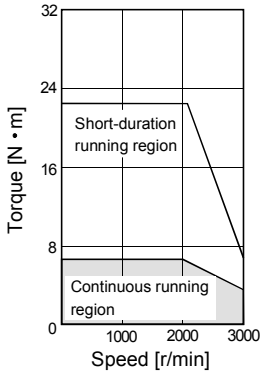
[HC-LFS52]



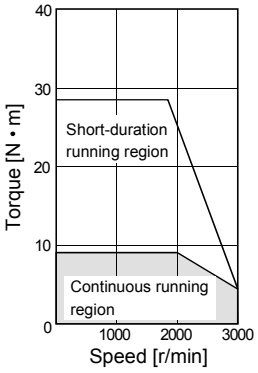
[HC-LFS102]



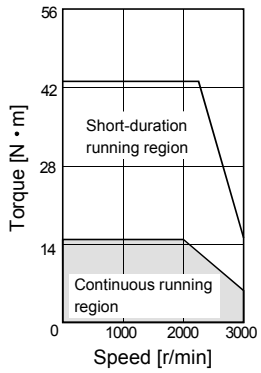
[HC-LFS152]



[HC-LFS202]



[HC-LFS302]



5.3 Servo motors with reduction gears

⚠ CAUTION	・The servo motor with reduction gear must be installed in the specified direction. Otherwise , it can leak oil, leading to a fire or fault. ・For the servo motor with reduction gear, transport it in the same status as in the installation method. Tipping it over can cause oil leakage.

Servo motors are available with reduction gears designed for: general industrial machines and precision applications.
Servo motors with electromagnetic brakes are also available.

(1) Manufacturing range of servo motor with reduction gear

Servo motors with reduction gears that may be manufactured are indicated by symbols (G1・G1H, G2) in the following table. G1・G1H and G2 are symbols appended to the servo motor models.

Reduction Gear Series	For General Industrial Machines												For Precision Applications							
Reduction ratio / Servo Motor	(Note) 1/5	1/6	(Note) 1/10	1/11	(Note) 1/12	1/17	(Note) 1/20	1/29	(Note) 1/30	1/35	1/43	1/59	1/5	1/9	1/10	1/15	1/20	1/25	1/29	1/45
HC-KF053□ to 43□ HC-KFS053□ to 73□	G1				G1		G1						G2	G2			G2		G2	
HC-MF053□ to 73□ HC-MFS053□ to 73□	G1				G1		G1						G2	G2			G2		G2	
HA-FF053□	G1		G1				G1		G1				G2		G2	G2		G2		
HA-FF13□	G1		G1				G1		G1				G2		G2	G2		G2		G2
HA-FF23□	G1		G1				G1		G1				G2		G2	G2	G2		G2	G2
HA-FF33□	G1		G1				G1		G1				G2		G2		G2		G2	G2
HA-FF43□・63□	G1		G1				G1		G1				G2	G2			G2		G2	G2
HC-SF52□ to 202□ HC-SFS52(4)□ to 202(4)□		G1 G1H		G1 G1H		G1 G1H		G1 G1H		G1 G1H	G1 G1H	G1 G1H	G2	G2			G2		G2	G2
HC-SF352□ HC-SFS352(4)□		G1 G1H		G1 G1H		G1 G1H		G1 G1H		G1 G1H	G1 G1H	G1 G1H	G2	G2			G2			
HC-SF502□ HC-SFS502(4)□				G1 G1H		G1 G1H		G1 G1H		G1 G1H	G1 G1H		G2	G2						
HC-SF702□ HC-SFS702(4)□				G1 G1H		G1 G1H		G1 G1H		G1 G1H	G1 G1H		G2							
HC-RF103□ to 203□ HC-RFS103□ to 203□													G2	G2			G2		G2	G2
HC-RF353□ HC-RFS353□													G2	G2			G2		G2	
HC-RF503□ HC-RFS503□													G2	G2			G2			

Note. Reduction ratios for general industrial machines are nominal values. For actual reduction ratios, refer to (2) and (3) in this section.
For those without (Note), the nominal value is equal to the actual reduction ratio.

(2) HC-MF/HC-KF/HC-MFS/HC-KFS series

<table>
<tr><td colspan="2">Reduction Gear Series</td><td colspan="5">For General Industrial Machines
(HC-KF□G1/HC-MF□G1)
(HC-KFS□G1/HC-MFS□G1)</td><td>For Precision Applications
(HC-KF□G2/HC-MF□G2)
(HC-KFS□G2/HC-MFS□G2)</td></tr>
<tr><td colspan="2">Mounting method</td><td colspan="6">Flange mounting</td></tr>
<tr><td colspan="2">Mounting direction</td><td colspan="6">In any directions</td></tr>
<tr><td rowspan="3">Lubrication method</td><td rowspan="2">Packed with</td><td colspan="5">(Note 2) Grease lubrication (Already packed)</td><td>(Note 2) Grease lubrication (Already packed)</td></tr>
<tr><td>50 • 100W</td><td>200W • 400W
1/12, 1/20</td><td>750W
1/12</td><td>200W • 400W
1/5</td><td>750W
1/5, 1/20</td><td rowspan="2">LOR#101BV Oil Center Research</td></tr>
<tr><td>Mobilplex 46
Mobil Oil</td><td colspan="2">Molynoc AP2
NIPPON OIL CORPORATION</td><td colspan="2">Mobil Grease SP
Mobil Oil</td></tr>
<tr><td colspan="2">Output shaft rotating direction</td><td colspan="6">Same as the servo motor output shaft direction.</td></tr>
<tr><td colspan="2">With electromagnetic brake</td><td colspan="6">Available</td></tr>
<tr><td colspan="2">Backlash</td><td colspan="5">60 minutes or less at reduction gear output shaft</td><td>3 minutes or less at reduction gear output shaft</td></tr>
<tr><td colspan="2">(Note 1) Permissible load inertia moment ratio (when converting into the servo motor shaft)</td><td colspan="5">HC-KF • HC-KFS
When 50W • 100W • 750W used: 5 times or less
When 200W • 400W used: 7 times or less
HC-MF • HC-MFS:25 times or less</td><td>HC-KF • HC-KFS
When 50W • 100W • 750W used: 5 times or less
When 200W • 400W used: 7 times or less
HC-MF • HC-MFS: 25 times or less</td></tr>
<tr><td colspan="2">Permissible speed
(at servo motor shaft)</td><td colspan="6">4500 r/min</td></tr>
<tr><td colspan="2">Reduction gear efficiency (Note 3)</td><td colspan="5">45 to 75%</td><td>60 to 80%</td></tr>
</table>

Note 1. If the above indicated value is exceeded, please consult us.

2. Maintenance-free.

3. The reduction gear efficiency differs depending on the reduction ratio.
Also, it changes depending on the use conditions such as the output torque, speed and rotation, temperature, etc. The numerical value in the table is a typical value in the rated torque, rated speed and rotation and typical temperature, and not a guaranteed value.

The actual reduction ratios of the servo motors with reduction gears designed for general industrial machines are as listed below.

Servo Motor / Nominal Reduction Ratio	HC-KF053(B)G1 HC-MF053(B)G1 HC-KFS053(B)G1 HC-MFS053(B)G1	HC-KF13(B)G1 HC-MF13(B)G1 HC-KFS13(B)G1 HC-MFS13(B)G1	HC-KF23(B)G1 HC-MF23(B)G1 HC-KFS23(B)G1 HC-MFS23(B)G1	HC-KF43(B)G1 HC-MF43(B)G1 HC-KFS43(B)G1 HC-MFS43(B)G1	HC-KFS73(B)G1 HC-MF73(B)G1 HC-MFS73(B)G1
1/5	9/44		19/96		1/5
1/12	49/576		25/288		525/6048
1/20	25/484		253/5000		625/12544

(3) HA-FF series

Reduction Gear Series		For General Industrial Machines (HA-FF□G1)		For Precision Applications (HA-FF□G2)
Mounting method		Flange mounting		
Mounting direction		In any directions		
Lubrication method		(Note 3) Grease lubrication (Already packed)		(Note 3) Grease lubrication (Already packed)
	Packed with	50・100W	200 to 600W	LOR#101BV Oil Center Research
		SUMICO LUBRICANT MOLY PS GREASE No.2	PYRONOC UNIVERSAL No.000 NIPPON PETRQLEUM	
Output shaft rotating direction		Servo motor shaft and reduction gear output shaft rotate in the same direction. For the HA-FF053G1 1/30 and HA-FF3G1 1/30, however, the servo motor shaft and reduction gear output shaft rotate in the opposite directions.		Servo motor shaft and reduction gear output-shaft rotate in the same direction.
With electromagnetic brake		Available		
Backlash		(Note 1) 40 minutes to 1.5°		Within 3 minutes
(Note 2) Permissible load inertia moment ratio (when converting into the servo motor shaft)		5 times or less		
Permissible speed (at servo motor shaft)		3000 r/min		
Reduction gear efficiency (Note 4)		73 to 85%		80 to 90%

Note 1. The above values are typical values and not guaranteed values.
2. If the above indicated value is exceeded, please consult us.
3. Maintenance-free.
4. The reduction gear efficiency differs depending on the reduction ratio.
Also, it changes depending on the use conditions such as the output torque, speed and rotation, temperature, etc. The numerical value in the table is a typical value in the rated torque, rated speed and rotation and typical temperature, and not a guaranteed value.

The actual reduction ratios of the servo motors with reduction gears designed for general industrial machines are as listed below.

Servo Motor / Nominal Reduction Ratio	HA-FF053G1	HA-FF13G1	HA-FF23G1	HA-FF33G1	HA-FF43G1	HA-FF63G1
1/5	9/44		57/280	19/94		10/49
1/10	3/29		39/400	39/376		243/2401
1/20	99/1972		51/980	72/1363		153/2891
1/30	144/4205		1/30	11/329		27/784

(4) HC-SF/HC-SFS series

Reduction Gear Series		For General Industrial Machines (HC-SF□G1(H)/HC-SFS□G1(H))	For Precision Applications (HC-SF□G2/ HC-SFS□G2)
Mounting method		As in (a) in this section	Flange mounting
Mounting direction		As in (a) in this section	In any directions
Lubrication method		As in (a) • (b) in this section	(Note 4) Grease lubrication (Already packed)
	(Note 2) Recommended products	As in (b) in this section	LOR#101BV Oil Center Research
Output shaft rotating direction		Opposite direction to the servo motor shaft	Same direction as the servo motor shaft
With electromagnetic brake		Available	
Backlash		40 minutes to 2*at reduction gear output shaft (Note 1)	3 minutes or less at reduction gear output shaft
(Note 3) Permissible load inertia moment ratio (when converting into the servo motor shaft)		4 times or less	5 times or less
Permissible speed (at servo motor shaft)		2000 r/min	0.5 to 1.5kW:3000 r/min 2 to 3.5kW:2500 r/min 5 • 7kW:2000 r/min
Reduction gear efficiency (Note 5)		85 to 94%	80 to 90%

Note 1. The above values are typical values and not guaranteed values.
2. For grease lubrication, the reduction gear is already grease-packed.
3. If the above indicated value is exceeded, please consult us.
4. Maintenance-free.
5. The reduction gear efficiency differs depending on the reduction ratio.
Also, it changes depending on the use conditions such as the output torque, speed and rotation, temperature, etc. The numerical value in the table is a typical value in the rated torque, rated speed and rotation and typical temperature, and not a guaranteed value.

(a) Lubrication of reduction gears for general industrial machines

Oil lubrication cannot be used in applications where the servo motor will move. Specify grease lubrication.

For grease lubrication, the reduction gear is already grease-packed.

For oil lubrication, pack the reduction gear with oil on the customer side.

Mounting Direction / Reduction gear model / Reduction gear frame No.	Shaft in Any Direction		Shaft Horizontal		Shaft Downward		Shaft Upward	
	CNHM (leg type)	CNVM (flange type)	CHHM (leg type)	CHVM (flange type)	CVHM (leg type)	CVVM (flange type)	CWHM (leg type)	CWVM (flange type)
4105	Grease	Grease						
4115	Grease	Grease						
4135			(Note) Oil	(Note) Oil	(Note) Oil	(Note) Oil	Grease	Grease
4165			(Note) Oil	(Note) Oil	(Note) Oil	(Note) Oil	Grease	Grease
4175			Oil	Oil	Oil	Oil		
4185			Oil	Oil	Oil	Oil		
4195			Oil	Oil	Oil	Oil		

Note. Grease-lubricated type is also available optionally.

The reduction gear frame numbers are as follows.

Servo Motor	Reduction Ratio						
	1/6	1/11	1/17	1/29	1/35	1/43	1/59
HC-SF52(B)G1 (H) HC-SFS52(B)G1 (H) HC-SFS524(B)G1 (H)	4105				4115		
HC-SF102(B)G1 (H) HC-SFS102(B)G1 (H) HC-SFS1024(B)G1 (H)	4115					4135	4165
HC-SF152(B)G1 (H) HC-SFS152(B)G1 (H) HC-SFS1524(B)G1 (H)	4115			4135		4165	
HC-SF202(B)G1 (H) HC-SFS202(B)G1 (H) HC-SFS2024(B)G1 (H)	4115			4165			
HC-SF352(B)G1 (H) HC-SFS352(B)G1 (H) HC-SFS3524(B)G1 (H)	4135			4165		4175	
HC-SF502(B)G1 (H) HC-SFS502(B)G1 (H) HC-SFS5024(B)G1 (H)		4165		4185			
HC-SF702(B)G1 (H) HC-SFS702(B)G1 (H) HC-SFS7024(B)G1 (H)		4175		4185		4195	

(b) Recommended lubricants

1) Grease

Albania Grease/Shell OIL

2) Lubricating oil

POINT

・Since the oil-lubricated models are shipped without oil, make sure to fill oil up to the upper red line of the oil gauge before operation.

Ambient Temperature ℃	COSMO OIL	NIPPON OIL CORPORATION	IDEMITSU KOSAN CO., LTD	Shell OIL	ESSO OIL GENERAL OIL	Mobil OIL	Japan Energy
-10 to 5	COSMO GEAR SE68	BONNOC M68 DIAMOND GEAR LUBE SP68	DAPHNE SUPER GEAR OIL 68	Omala Oils 68	SPARTAN EP68	Mobilgear 626 (ISO VG68)	JOMO Reductus 68
0 to 35	COSMO GEAR SE100・150	BONNOC M100・150 DIAMOND GEAR LUBE SP100・150	DAPHNE SUPER GEAR OIL 100・150	Omala Oils 100・150	SPARTAN EP100・150	Mobilgear 627・629 (ISO VG100・150)	JOMO Reductus 100・150
30 to 50	COSMO GEAR SE200・320・460	BONNOC M200 to 460 DIAMOND GEAR LUBE SP220 to 460		Omala Oils 200 to 460	SPARTAN EP220 to 460	Mobilgear 630 to 634 (ISO VG220 to 460)	JOMO Reductus 200 to 460

Lubricating oil fill amount (ℓ)

Reduction gear frame No.	Fill amount [ℓ]	
	Horizontal type	Vertical type
4135	0.7	1.1
4165	1.4	1.0
4175	1.9	1.9
4185	2.5	2.0
4195	4.0	2.7

(c) Changing intervals of lubricant for general industrial machines

1) Grease

Maintenance-free. (Limited to the case where the grease-lubricated type is standard.)

2) Lubricant

Changing intervals	Operation hours per day	
	Less than 10 hours	10 to 24 hours
First time	500 hours	
Second time and later	Half year	2500 hours

(5) HC-RF/HC-RFS series

Reduction Gear Series		For Precision Applications (HC-RF□G2/HC-RFS□G2)
Mounting method		Flange mounting
Mounting direction		In any directions
Lubrication method		(Note 2) Grease lubrication (Already packed)
	Packed with	LOR#101BV Oil Center Research
Output shaft rotating direction		Same direction as the servo motor shaft
With electromagnetic brake		Available
Backlash		Within 3 minutes at reduction gear output shaft
(Note 1) Permissible load inertia moment ratio (when converting into the servo motor shaft)		5 times or less
Permissible speed (at servo motor shaft)		4000 r/min
Reduction gear efficiency (Note 3)		80 to 90%

Note 1. If the above indicated value is exceeded, please consult us.

2. Maintenance-free.

3. The reduction gear efficiency differs depending on the reduction ratio.
Also, it changes depending on the use conditions such as the output torque, speed and rotation, temperature, etc. The numerical value in the table is a typical value in the rated torque, rated speed and rotation and typical temperature, and not a guaranteed value.

5.4 Servo motors with special shafts

The standard shaft of the servo motor is straight without a keyway. Shafts with keyway and D cut are also available. Except for the servo motor with reduction gear.
These shafts are not appropriate for applications where the servo motor is started and stopped frequently. Use a friction coupling or the like with such keys since we cannot guarantee such trouble as broken shafts due to loose keys.

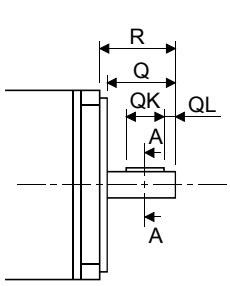
Servo Motor Model	Shaft Shape		
	Keyway	D cut	Straight
HC-MF053 · 13 HC-MFS053 · 13		○	(Note 4) ○
HC-MF23 to 73 HC-MFS23 to 73	(Note 1) ○		(Note 4) ○
HA-FF053 · 13		○	(Note 4) ○
HA-FF23 to 63	(Note 3) ○		(Note 4) ○
HC-SF81 to 301 HC-SF52 to 702 HC-SF53 to 353 HC-SFS81 to 301 HC-SFS52 to 702 HC-SFS53 to 353 HC-SFS524 to 7024	(Note 2) ○		(Note 4) ○

Servo Motor Model	Shaft Shape		
	Keyway	D cut	Straight
HC-RF103 to 503 HC-RFS103 to 503	(Note 2) ○		(Note 4) ○
HC-UF72 to 502 HC-UFS72 to 502	(Note 2) ○		(Note 4) ○
HC-UF13 HC-UFS13		○	(Note 4) ○
HC-UF23 to 73 HC-UFS23 to 73	(Note 1) ○		(Note 4) ○
HC-KF053 · 13 HC-KFS053 · 13		○	(Note 4) ○
HC-KF23 · 43 HC-KFS23 to 73	(Note 1)○		(Note 4) ○
HC-AQ0135 to 0335		(Note 4) ○	○
HC-LFS	(Note 2) ○		(Note 4) ○
HA-LA HA-LFS	(Note 2) ○		(Note 4) ○

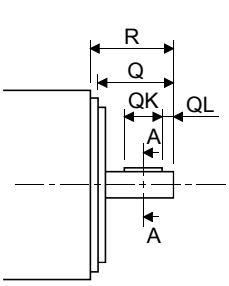
Note 1. With a key.
2. Without a key.
3. Standard with a key. For shape, refer to chapter 7.
4. This is a standard. For shape, refer to chapter 7.

5.4.1 Keyway

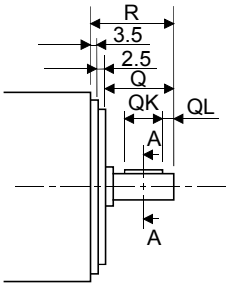
(1) With key



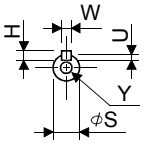
HC-MF(S)23K to 73K
HC-KF23K · 43K
HC-KFS23K to 73K



HC-UF(S)23K · 43K



HC-UF(S) 73K



Section A-A

[Unit: mm]
([Unit: in])

Servo Motor Model	Variable Dimensions								
	S	R	Q	W	QK	QL	U	H	Y
HC-MF23K · 43K HC-MFS23K · 43K	14h6 (14)	30 (1.18)	27 (1.06)	5 (0.20)	20 (0.79)	3 (0.12)	3 (0.12)	5 (0.20)	M4 Depth 15 (0.59)
HC-MF73K HC-MFS73K	19h6 (19)	40 (1.57)	37 (1.46)	6 (0.24)	25 (0.98)	5 (0.20)	3.5 (0.14)	6 (0.24)	M5 Depth 20 (0.79)
HC-UF23K · 43K HC-UFS23K · 43K	14h6 (14)	30 (1.18)	23.5 (0.93)	5 (0.20)	20 (0.79)	3 (0.12)	3 (0.12)	5 (0.20)	M4 Depth 15 (0.59)
HC-UF73K HC-UFS73K	19h6 (19)	40 (1.57)	32.5 (1.28)	6 (0.24)	25 (0.98)	5 (0.20)	3.5 (0.14)	6 (0.24)	M5 Depth 20 (0.79)
HC-KF23K · 43K HC-KFS23K · 43K	14h6 (14)	30 (1.18)	27 (1.06)	5 (0.20)	20 (0.79)	3 (0.12)	3 (0.12)	5 (0.20)	M4 Depth 15 (0.59)
HC-KFS73K	19h6 (19)	40 (1.57)	37 (1.46)	6 (0.24)	25 (0.98)	5 (0.20)	3.5 (0.14)	6 (0.24)	M5 Depth 20 (0.79)

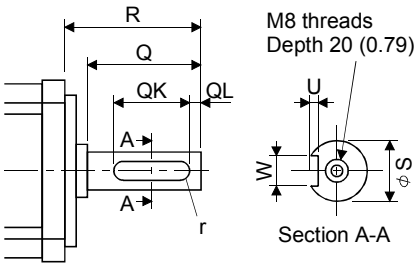
(2) Without key

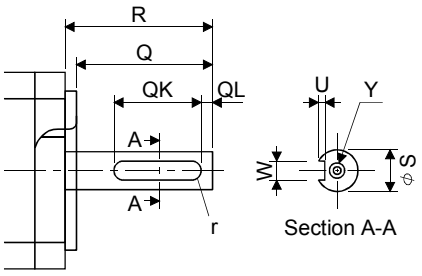
[Unit: mm]
([Unit: in])

Servo Motor Model	Variable Dimensions								Drawing
	S	R	Q	W	QK	QL	U	r	
HC-SF81K HC-SF52K to 152K HC-SF53K to 153K HC-SFS81K HC-SFS52(4)K to 152(4)K HC-SFS53K to 153K HC-LFS52K to 152K	24h6 (0.94)	55 (2.17)	50 (1.97)	$8^{0}_{-0.036}$ (0.31)	36 (1.42)	5 (0.20)	$4^{+0.2}_{0}$ (0.16)	4 (0.16)	A
HC-SF121K to 301K HC-SF202K to 702K HC-SF203K・353K HC-SFS121K to 301K HC-SFS202(4)K to 702(4)K HC-SFS203K・353K HC-LFS202K・302K	$35^{+0.010}_{0}$ (1.38)	79 (3.11)	75 (2.95)	$10^{0}_{-0.036}$ (0.39)	55 (2.17)	5 (0.20)	$5^{+0.2}_{0}$ (0.20)	5 (0.20)	
HC-RF103K to 203K HC-RFS103K to 203K	24h6 (0.94)	45 (1.79)	40 (1.57)	$8^{0}_{-0.036}$ (0.31)	25 (0.98)	5 (0.20)	$4^{+0.2}_{0}$ (0.16)	4 (0.16)	
HC-RF353K to 503K HC-RFS353K to 503K	28h6 (1.10)	63 (2.48)	58 (2.28)	$8^{0}_{-0.036}$ (0.31)	45 (1.77)	3 (0.12)	$4^{+0.2}_{0}$ (0.16)	4 (0.16)	
HC-UF72K HC-UFS72K	22h6 (0.87)	55 (2.17)	50 (1.97)	$6^{0}_{-0.036}$ (0.24)	42 (1.65)	3 (0.12)	$3.5^{+0.1}_{0}$ (0.14)	3 (0.12)	
HC-UF152K HC-UFS152K	28h6 (1.10)	55 (2.17)	50 (1.97)	$8^{0}_{-0.036}$ (0.31)	40 (1.58)	5 (0.20)	$4^{+0.2}_{0}$ (0.16)	4 (0.16)	
HC-UF202K to 502K HC-UFS202K to 502K	$35^{+0.010}_{0}$ (1.38)	65 (2.56)	60 (2.36)	$10^{0}_{-0.036}$ (0.39)	50 (1.97)	5 (0.20)	$5^{+0.2}_{0}$ (0.20)	5 (0.20)	

[Unit: mm]
([Unit: in])

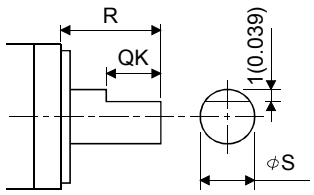
Servo Motor Model	Variable Dimensions									Drawing
	S	R	Q	W	QK	QL	U	r	Y	
HA-LFS502K・702K・11K2(4)K HA-LFS601(4)K HA-LFS701M(4)K	42h6 (1.65)	85 (3.35)	80 (3.15)	$12^{0}_{-0.04}$ (0.47)	70 (2.76)	5 (0.20)	$5^{+0.2}_{0}$ (0.20)	6 (0.24)	Same as the straight shaft of the standard motor.	A
HA-LFS801(4)K・12K1(4)K HA-LFS11K1M(4)K・15K1M(4)K HA-LFS15K2(4)K・22K2(4)K	55m6 (2.17)	110 (4.33)	100 (3.94)	$16^{0}_{-0.04}$ (0.63)	90 (3.54)	5 (0.20)	$6^{+0.2}_{0}$ (0.24)	8 (0.31)		
HA-LF30K2(4)K・37K2(4)K HA-LFS15K1(4)K・20K1(4)K HA-LFS22K1M(4)K・30K1M(4)K HA-LFS30K2(4)K・37K2(4)K	60m6 (2.36)	140 (5.51)	140 (5.51)	$18^{0}_{-0.04}$ (0.71)	128 (5.04)	6 (0.24)	$7^{+0.2}_{0}$ (0.28)	9 (0.35)		B
HA-LF45K24K・55K24K HA-LFS25K1(4)K・30K1(4)K HA-LFS37K1M(4)K・45K1M4K HA-LFS45K24K・55K24K	65m6 (2.56)	140 (5.51)	140 (5.51)	$18^{0}_{-0.04}$ (0.71)	128 (5.04)	6 (0.24)	$7^{+0.2}_{0}$ (0.28)	9 (0.35)		
HA-LFS37K1(4)K HA-LFS50K1M4K	80m6 (3.15)	170 (6.69)	170 (6.69)	$22^{0}_{-0.04}$ (0.87)	147 (5.79)	11 (0.43)	$9^{+0.2}_{0}$ (0.35)	11 (0.43)		





5.4.2 D cut

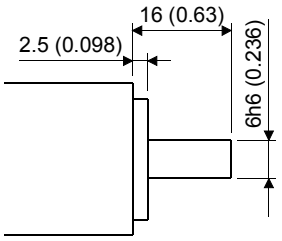
[Unit: mm]
([Unit: in])



Servo Motor Model	Variable Dimensions		
	R	QK	S
HC-KF053D・13D HC-KFS053D・13D HC-MF053D・13D HC-MFS053D・13D	25(0.98)	20.5(0.81)	8h(0.32)
HA-FF053D・13D	30(1.178)	25.5(1.00)	8h(0.32)
HC-UF13D HC-UFS13D	25(0.98)	17.5(0.69)	8h(0.32)

5.4.3 Straight (HC-AQ)

[Unit: mm]
([Unit: in])



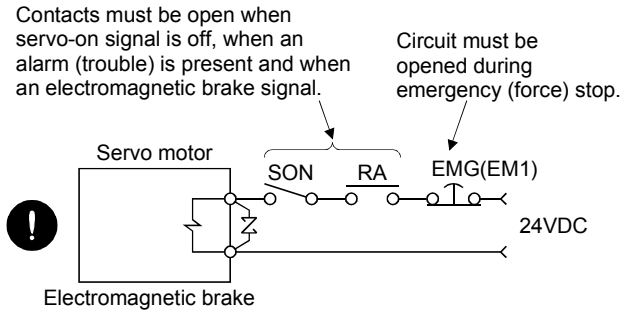
MEMO

6. CHARACTERISTICS

6.1 Electromagnetic brake characteristics

⚠ CAUTION

- Configure the electromagnetic brake circuit so that it is activated not only by the servo amplifier signals but also by an external emergency (forced) stop signal.



- The electromagnetic brake is designed to hold a load. Do not use it for braking.

The characteristics of the electromagnetic brake provided for the servo motor with electromagnetic brake are indicated below:

Table 6.1 Electromagnetic Brake Characteristics

Item \ Servo Motor			HC-MF Series HC-MFS Series			HA-FF Series		
			053B・13B	23B・43B	73B	053B・13B	23B・33B	43B・63B
Type (Note 1)			Spring-loaded safety brake					
Rated voltage (Note 4)			$24V^{0}_{-10\%}$ DC					
Power consumption		[W]20℃ (68℉)	6.3	7.9	9	7	7.4	11
Brake static friction torque		[N・m]	0.32	1.3	2.4	0.39	1.18	2.3
		[oz・in]	45.3	184.2	340	55.3	167	326
Release delay time (Note 2)		[s]	0.03	0.03	0.03	0.03	0.03	0.03
Braking delay time [s] (Note 2)	DC off		0.01	0.02	0.03	0.01	0.03	0.03
Permissible braking work	Per braking	[J]	5.6	22.0	64.0	3.9	18.0	46.0
		[oz・in]	793.6	3117.6	9069.3	552.7	2550.7	6518.6
	Per hour	[J]	56	220	640	39	180	460
		[oz・in]	7936	31176	90693	5527	25507	65186
Brake looseness at servo motor shaft [degrees] (Note 5)			0.19 to 2.5	0.12 to 1.2	0.1 to 0.9	0.3 to 3.5	0.2 to 2.0	0.2 to 1.3
Brake life (Note 3)	Number of braking cycles	[times]	20000	20000	20000	30000	30000	30000
	Work per braking	[J]	4	15	32	4	18	47
		[oz・in]	567	2126	4535	567	2551	6660

Item \ Servo Motor			HC-SF Series HC-SFS Series		HC-RF Series HC-RFS Series		HC-KF Series HC-KFS Series			HC-AQ Series
			81B 52B to 152B 53B to 153B 524B to 1524B (Note 7)	121B to 301B 202B to 702B 203B・353B 2024B to 7024B (Note 7)	103B to 203B	353B・503B	053B 13B	23B・43B	(Note 6) 73B	0135B to 0335B
Type (Note 1)			Spring-loaded safety brake							
Rated voltage (Note 4)			$24V^{0}_{-10\%}$DC							
Power consumption		[W]20℃ (68℉)	19	34	19	23	6.3	7.9	9	4.8
Brake static friction torque		[N・m]	8.3	43.1	6.8	16.7	0.32	1.3	2.4	0.098
		[oz・in]	1176	6103	964	2367	45	6108	340	13.878
Release delay time (Note 2)		[s]	0.04	0.1	0.03	0.04	0.03	0.1	0.03	0.02
Braking delay time [s] (Note 2)	DC off		0.03	0.03	0.03	0.03	0.01	0.02	0.03	0.01
Permissible braking work	Per braking	[J]	400	4500	400	400	5.6	22.0	64.0	4.6
		[oz・in]	56683.3	637687.1	56683.3	56683.3	793.6	3117.6	9069.3	63.882
	Per hour	[J]	4000	45000	4000	4000	56	220	640	46
		[oz・in]	566833	6376871	566833	566833	7936	31176	90693	638.821
Brake looseness at servo motor shaft (Note 5)		[degrees]	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.19 to 2.5	0.12 to 1.2	0.1 to 0.9	0.1 to 2.5
Brake life (Note 3)	Number of braking cycles	[times]	20000	20000	20000	20000	20000	20000	20000	20000
	Work per braking	[J]	200	1000	200	200	4	15	32	1
		[oz・in]	28342	141708	28342	28342	567	2124.18	4535	141.612

Item \ Servo Motor			HC-UF Series HC-UFS Series					HC-LFS Series	
			13B	23B・43B	73B	72B・152B	202B to 502B	52B to 152B	202B・302B
Type (Note 1)			Spring-loaded safety brake						
Rated voltage (Note 4)			$24V^{0}_{-10\%}$DC						
Power consumption		[W]20℃ (68℉)	6.3	7.9	10	19	34	19	34
Brake static friction torque		[N・m]	0.32	1.3	2.4	8.3	43.1	8.3	43.1
		[oz・in]	45	184	340	1175	6103	1175	6103
Release delay time (Note 2)		[s]	0.03	0.03	0.03	0.04	0.1	0.04	0.1
Braking delay time [s] (Note 2)	DC off		0.01	0.02	0.03	0.03	0.03	0.03	0.03
Permissible braking work	Per braking	[J]	5.6	22	64	400	4500	400	4500
		[oz・in]	793.6	3117.6	9069.3	56683.3	637687.1	56683.3	637687.1
	Per hour	[J]	56	220	640	4000	45000	4000	45000
		[oz・in]	7936	31176	90693	566833	6376871	566833	6376871
Brake looseness at servo motor shaft [degrees] (Note 5)			0.19 to 2.5	0.12 to 1.2	0.1 to 0.9	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6	0.2 to 0.6
Brake life (Note 3)	Number of braking cycles	[times]	20000	20000	20000	20000	20000	20000	20000
	Work per braking	[J]	4	15	32	200	1000	200	1000
		[oz・in]	567	2126	4535	28342	141708	28342	141708

Item \ Servo Motor			HA-LFS Series (200/400VAC-compatible)								
			601B 6014B	801B 8014B	12K1B 12K14B	701MB 701M4B	11K1MB 11K1M4B	15K1MB 15K1M4B	11K2B 11K24B	15K2B 15K24B	22K2B 22K24B
Type (Note 1)			Spring-loaded safety brake								
Rated voltage (Note 4)			$24V^{0}_{-10\%}$ DC								
Power consumption		[W]20℃ (68℉)	30	46	46	30	46	46	30	46	46
Brake static friction torque		[N・m]	82	160.5	160.5	82	160.5	160.5	82	160.5	160.5
		[oz・in]	11612	22729	22729	11612	22729	22729	11612	22729	22729
Release delay time (Note 2)		[s]	0.25	0.30	0.30	0.25	0.30	0.30	0.25	0.30	0.30
Braking delay time [s] (Note 2)	DC off		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Permissible braking work	Per braking	[J]	3000	5000	5000	3000	5000	5000	3000	5000	5000
		[oz・in]	424837	708061	708061	424837	708061	708061	424837	708061	708061
	Per hour	[J]	30000	50000	50000	30000	50000	50000	30000	50000	50000
		[oz・in]	4248369	7080614	7080614	4248369	7080614	7080614	4248369	7080614	7080614
Brake looseness at servo motor shaft [degrees] (Note 5)			to 0.8	to 0.8	to 0.8	to 0.8	to 0.8	to 0.8	to 0.8	to 0.8	to 0.8
Brake life (Note 3)	Number of braking cycles [times]		20000	20000	20000	20000	20000	20000	20000	20000	20000
	Work per braking	[J]	1000	3000	3000	1000	3000	3000	1000	3000	3000
		[oz・in]	141612	424837	424837	1416212	424837	424837	141612	424837	424837

Note 1. There is no manual release mechanism. When it is necessary to hand-turn the servo motor shaft for machine centering, etc., use a separate 24VDC power supply to release the brake electrically.
2. The value for initial ON gap at 20℃ (68℉).
3. The brake gap will increase as the brake lining wears, but the gap is not adjustable. The brake life indicated is the number of braking cycles after which adjustment will be required.
4. 24VDC of the internal power output for interface (VDD) cannot be used. Always use a separate power supply.
5. The above values are typical initial values and not guaranteed values.
6. 73B is not available for the HC-KF.
7. 524B to 7024B are not available for the HC-SF.

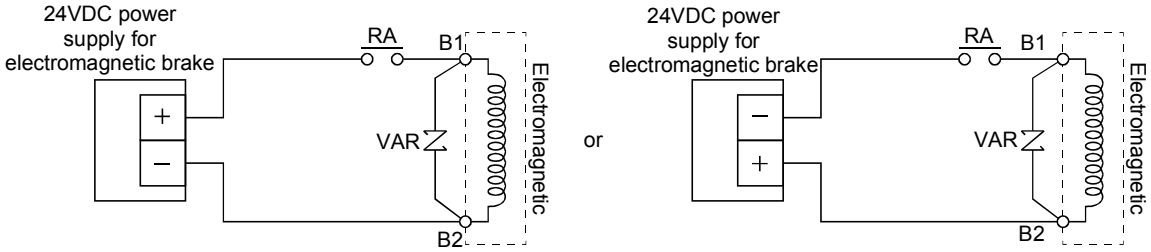
(1) Sound generation

Though the brake lining may rattle during operation, it poses no functional problem.

If braking sound occurs, it may be improved by setting the machine resonance suppression filter or adaptive vibration suppression control in the servo amplifier parameters. For details, refer to the servo amplifier instruction manual.

(2) Electromagnetic brake power supply

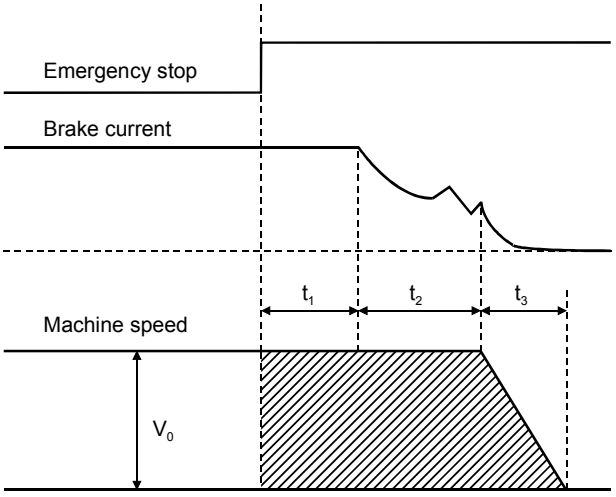
24VDC of the internal power output for interface (VDD) cannot be used. Prepare the following power supply for use with the electromagnetic brake only.



The surge absorber (VAR) must be installed across B1-B2. For the selection of the surge absorber, refer to OPTIONS AND AUXILIARY EQUIPMENT of the Servo Amplifier Instruction Manual.
The electromagnetic brake terminals (B1, B2) have no polarity.

(3) Coasting distance

At an emergency stop, the servo motor will decelerate to a stop in the pattern shown in the following diagram. Here, the maximum coasting distance (during fast feed), Lmax, will be the area shown with the diagonal line in the figure and can be calculated approximately with Equation 6.1. The effect of the load torque is greater near the stopping area. When the load torque is large, the servo motor will stop faster than the value obtained in the equation.



(4) Others

A leakage magnetic flux will occur at the shaft end of the servo motor equipped with electromagnetic brake. Note that chips, screws and other magnetic substances are attracted.

$$L\,max = \frac{Vo}{60} \cdot \left(t1 + t2 + \frac{t3}{2} \right) \quad \text{..... (6.1)}$$

Where,

L max :	Maximum coasting distance	[mm]
Vo:	Machine's fast feed speed	[mm/min]
t_1:	Delay time of control section	[s]
t_2:	Braking delay time of brake (Note)	[s]
t_3:	Braking time	[s]

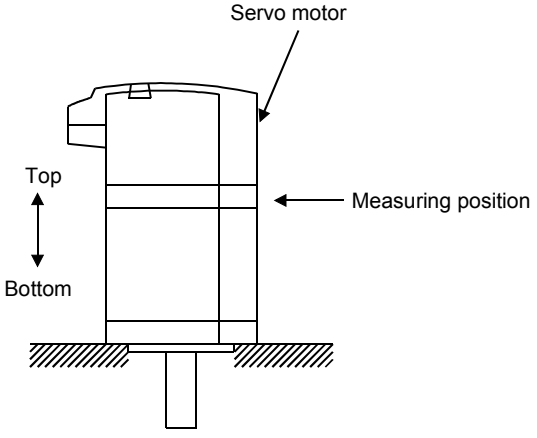
$$t_3 = \frac{(J_L + J_L) \cdot No}{9.55 \times 10^4 \cdot (T_L + 0.8T_B)}$$

J_L	: Load inertia moment converted into equivalent value on servo motor shaft	[kg・cm^2]
JM	: Servo motor inertia moment	[kg・cm^2]
No	: Servo motor speed during fast feed	[r/min]
T_L	: Load torque converted into equivalent value on servo motor shaft	[N・m]
T_B	: Brake static friction torque (Note)	[N・m]

Note. t_2 and TB are the values noted in Table 6.1 Characteristics. JL is the machine's inertia moment at the servo motor shaft.

6.2 Vibration rank

The vibration rank of the servo motor is V-10 at the rated speed. Measure vibration in the following position with the servo motor installed as shown below.



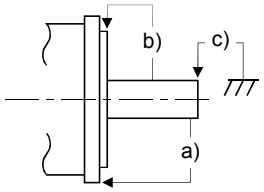
Servo Motor Vibration
Measuring Conditions

6.3 Machine accuracies

The following table indicates the machine accuracies of the servo motor around the output shaft and mounting. (except the optional products)

Accuracy [mm]	Measuring Position	Flange Size			
		Less than □100	□100 · □130	□176 to □250	□280 or more
Runout of flange surface to output shaft	a)	0.05	0.06	0.08	0.08
Runout of fitting OD of flange surface	b)	0.04	0.04	0.06	0.08
Runout of output shaft end	c)	0.02	0.02	0.03	0.03

Reference diagram



7. OUTLINE DIMENSION DRAWINGS

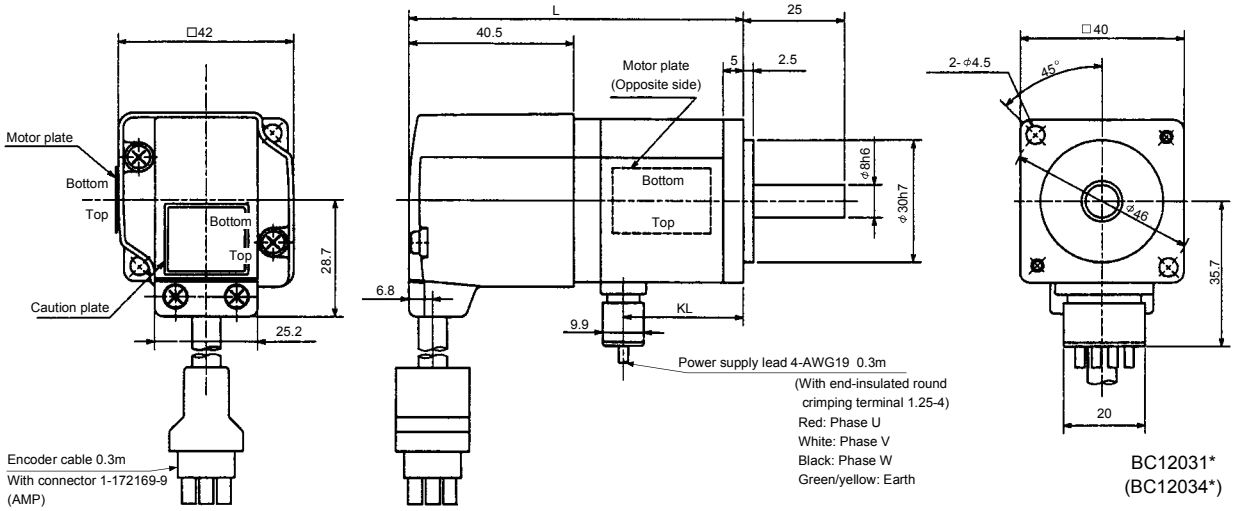
7.1 Servo motors

7.1.1 HC-MF・HC-KF series

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF053	50	81.5	29.5	0.019	0.40
HC-MF13	100	96.5	44.5	0.03	0.53
HC-KF053	50	81.5	29.5	0.053	0.40
HC-KF13	100	96.5	44.5	0.084	0.53

(Note)[Unit: mm]

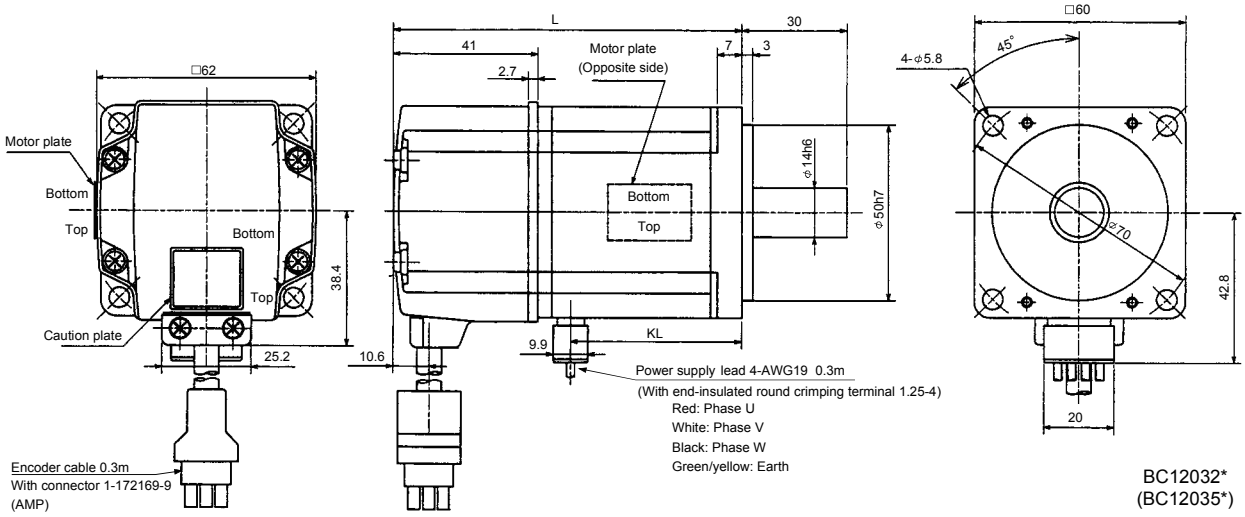


BC12031*
(BC12034*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF23	200	99.5	49.1	0.088	0.99
HC-MF43	400	124.5	72.1	0.143	1.45
HC-KF23	200	99.5	49.1	0.260	0.99
HC-KF43	400	124.5	72.1	0.460	1.45

(Note)[Unit: mm]



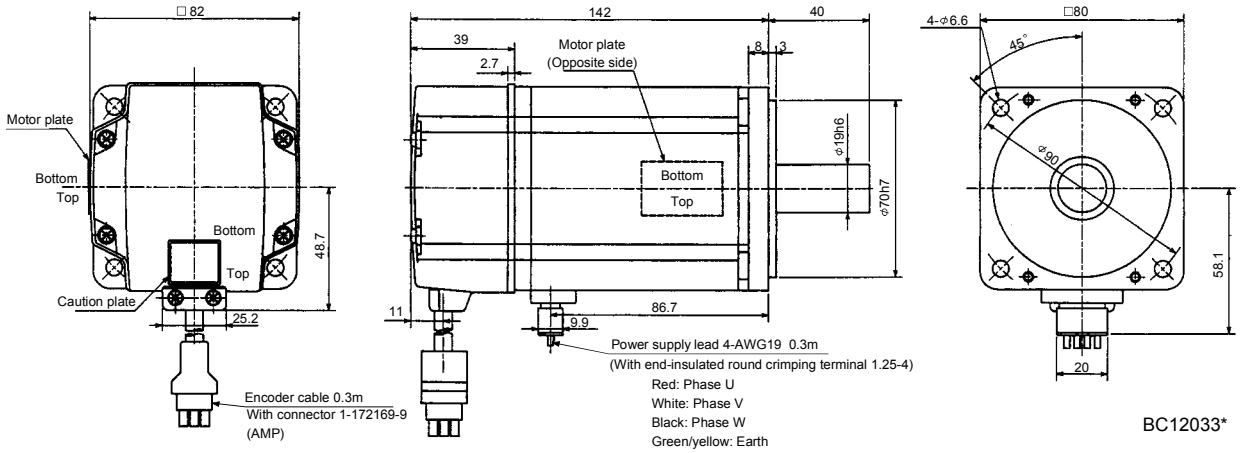
BC12032*
(BC12035*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73	750	0.6	3

(Note)[Unit: mm]

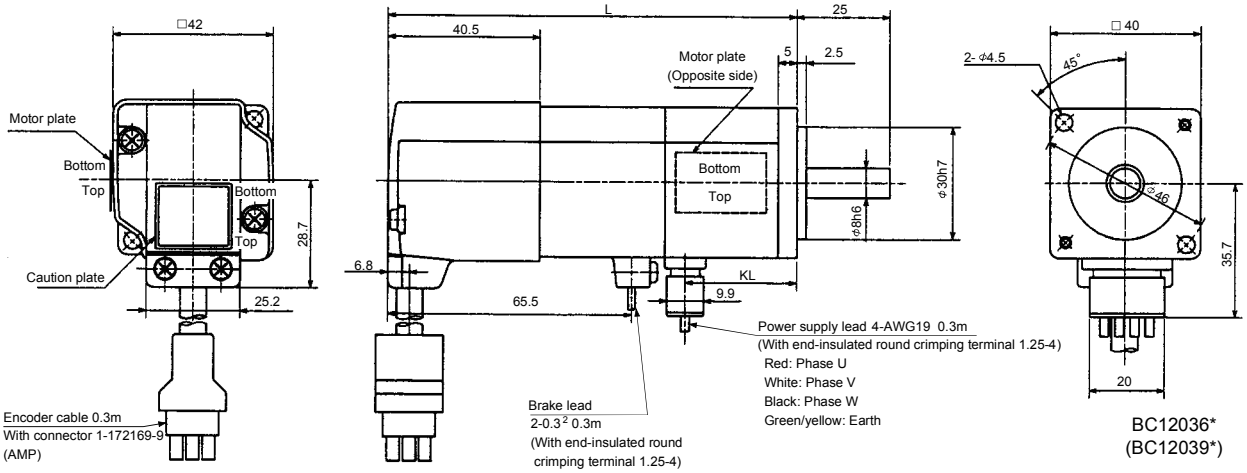


Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-MF053B	50	109.5	29.5	0.32	0.022	0.75
HC-MF13B	100	124.5	44.5	0.32	0.032	0.89
HC-KF053B	50	109.5	29.5	0.32	0.056	0.75
HC-KF13B	100	124.5	44.5	0.32	0.087	0.89

(Note)[Unit: mm]

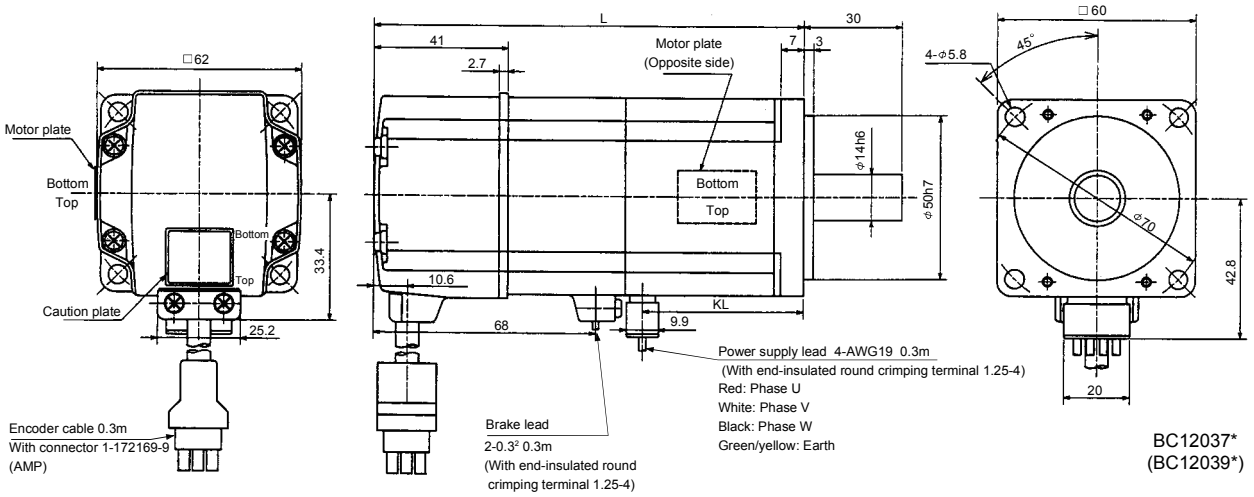


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-MF23B	200	131.5	49.1	1.3	0.136	1.6
HC-MF43B	400	156.5	72.1	1.3	0.191	2.1
HC-KF23B	200	131.5	49.1	1.3	0.310	1.6
HC-KF43B	400	156.5	72.1	1.3	0.510	2.1

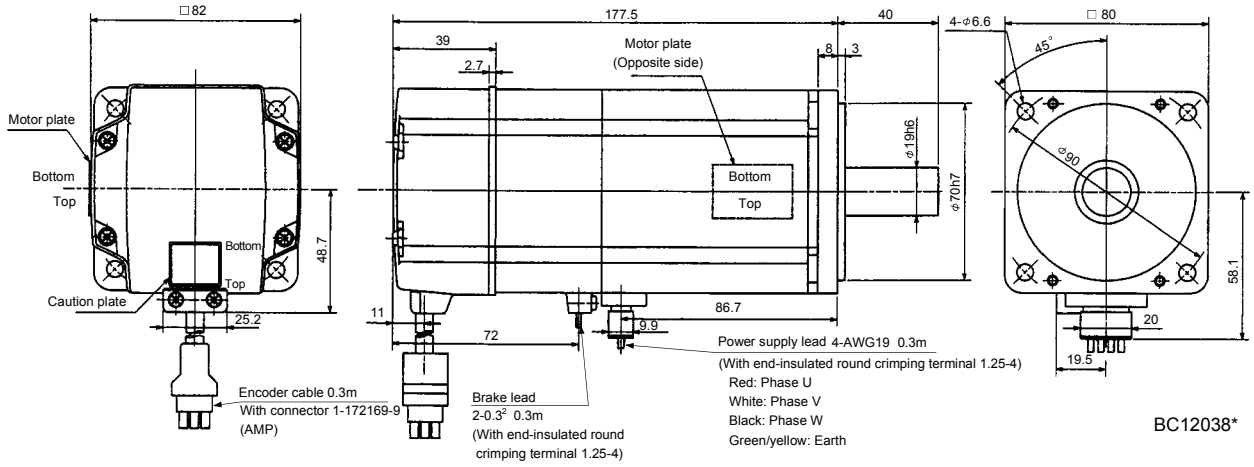
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73B	750	2.4	0.725	4.0

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

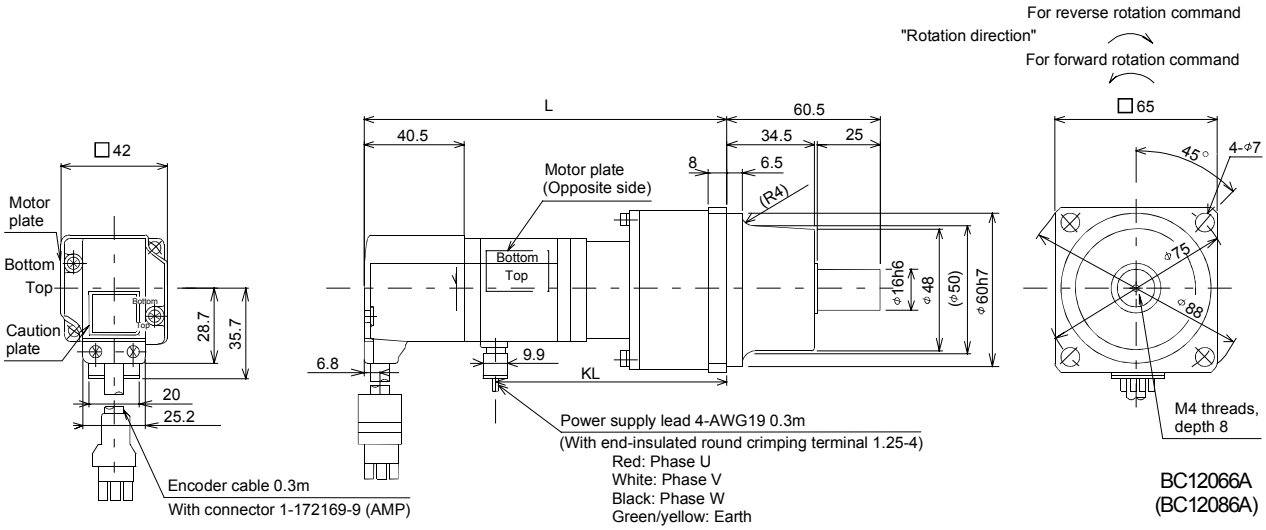
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF053G1	50	126	74	K6505	1/5(9/44)	0.055	60min. max.	1.4
HC-MF053G1	50	144	92	K6512	1/12(49/576)	0.077	60min. max.	1.8
HC-MF053G1	50	144	92	K6520	1/20(25/484)	0.059	60min. max.	1.8
HC-KF053G1	50	126	74	K6505	1/5(9/44)	0.090	60min. max.	1.4
HC-KF053G1	50	144	92	K6512	1/12(49/576)	0.112	60min. max.	1.8
HC-KF053G1	50	144	92	K6520	1/20(25/484)	0.094	60min. max.	1.8

(Note)[Unit: mm]

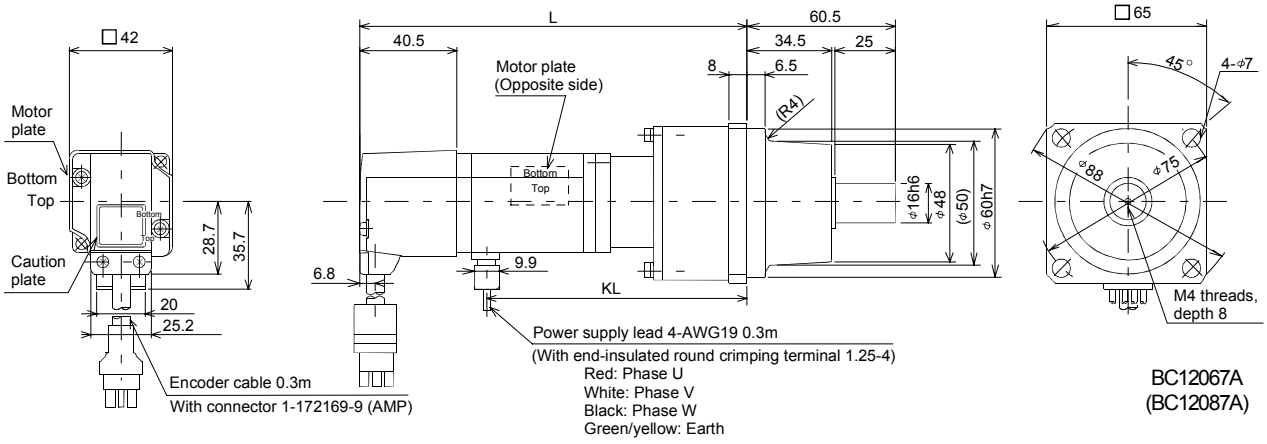


BC12066A
(BC12086A)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF13G1	100	141	89	K6505	1/5(9/44)	0.067	60min. max.	1.5
HC-MF13G1	100	159	107	K6512	1/12(49/576)	0.089	60min. max.	1.9
HC-MF13G1	100	159	107	K6520	1/20(25/484)	0.071	60min. max.	1.9
HC-KF13G1	100	141	89	K6505	1/5(9/44)	0.121	60min. max.	1.5
HC-KF13G1	100	159	107	K6512	1/12(49/576)	0.143	60min. max.	1.9
HC-KF13G1	100	159	107	K6520	1/20(25/484)	0.125	60min. max.	1.9

(Note)[Unit: mm]



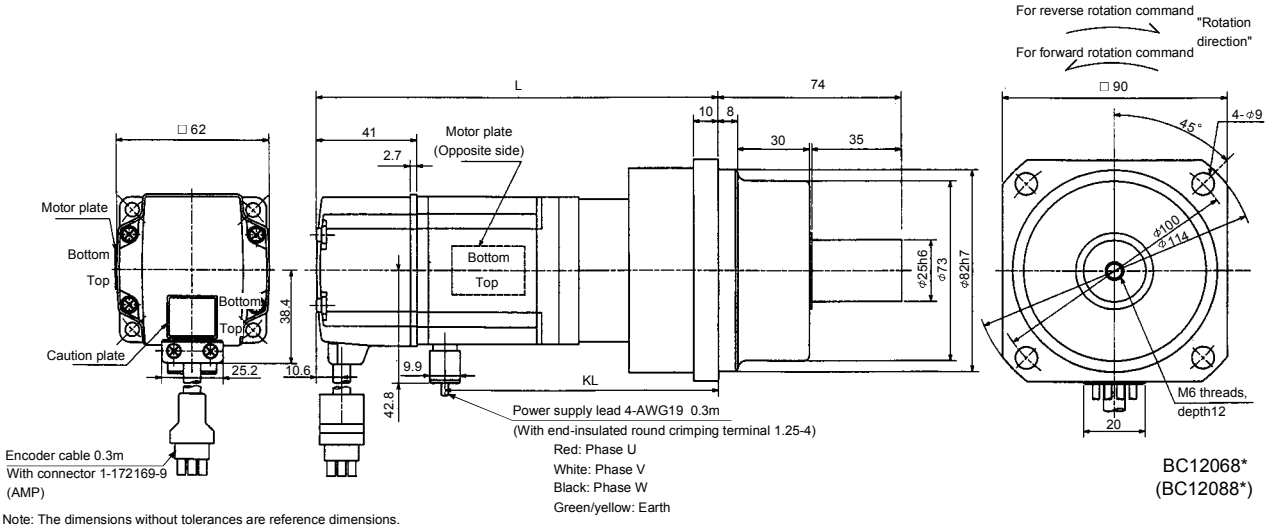
BC12067A
(BC12087A)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF23G1	200	153	102.6	K9005	1/5(19/96)	0.249	3.3
HC-MF23G1	200	173	122.6	K9012	1/12(25/288)	0.293	3.9
HC-MF23G1	200	173	122.6	K9020	1/20(253/5000)	0.266	3.9
HC-KF23G1	200	153	102.6	K9005	1/5(19/96)	0.420	3.3
HC-KF23G1	200	173	122.6	K9012	1/12(25/288)	0.470	3.9
HC-KF23G1	200	173	122.6	K9020	1/20(253/5000)	0.440	3.9

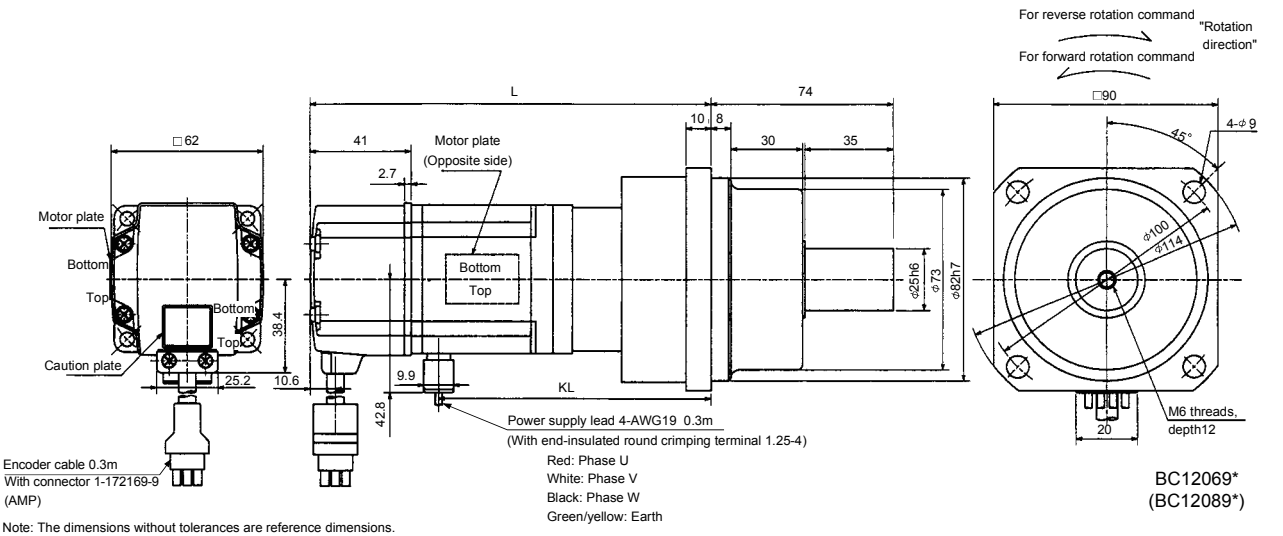
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF43G1	400	178	125.6	K9005	1/5(19/96)	0.296	3.8
HC-MF43G1	400	198	145.6	K9012	1/12(25/288)	0.339	4.4
HC-KF43G1	400	178	125.6	K9005	1/5(19/96)	0.610	3.8
HC-KF43G1	400	198	145.6	K9012	1/12(25/288)	0.660	4.4

(Note)[Unit: mm]



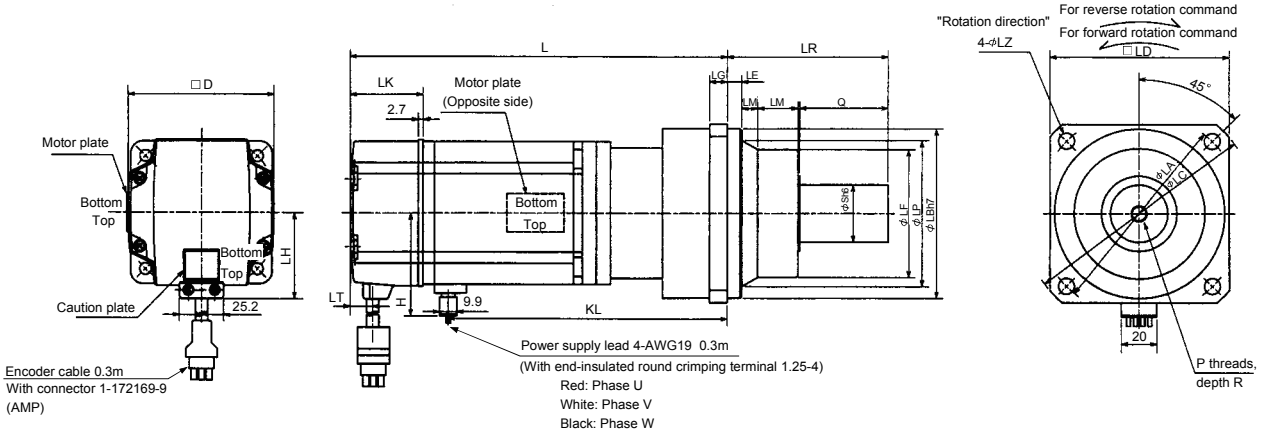
Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-MF43G1	400	K10020	1/20	253/5000	0.653	60min. max.	5.5
HC-MF73G1	750	K10005	1/5	1/5	1.02	60min. max.	6.2
HC-MF73G1	750	K10012	1/12	525/6048	1.686	60min. max.	7.3
HC-MF73G1	750	K12020	1/20	625/12544	1.75	60min. max.	10.1

Model	Output [W]	Variable Dimensions																				
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MF43G1	400	62	38.4	41	10.6	42.8	115	95	132	100	10	73	10	13	16	86	201.5	90	149.1	9	50	32	M8	16
HC-MF73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	207	90	151.7	9	50	32	M8	16
HC-MF73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	229	90	173.7	9	50	32	M8	16
HC-MF73G1	750	82	48.7	39	11	58.1	140	115	162	120	12	90	15	13	20	104	242	106	186.7	14	60	40	M10	20

(Note)[Unit: mm]

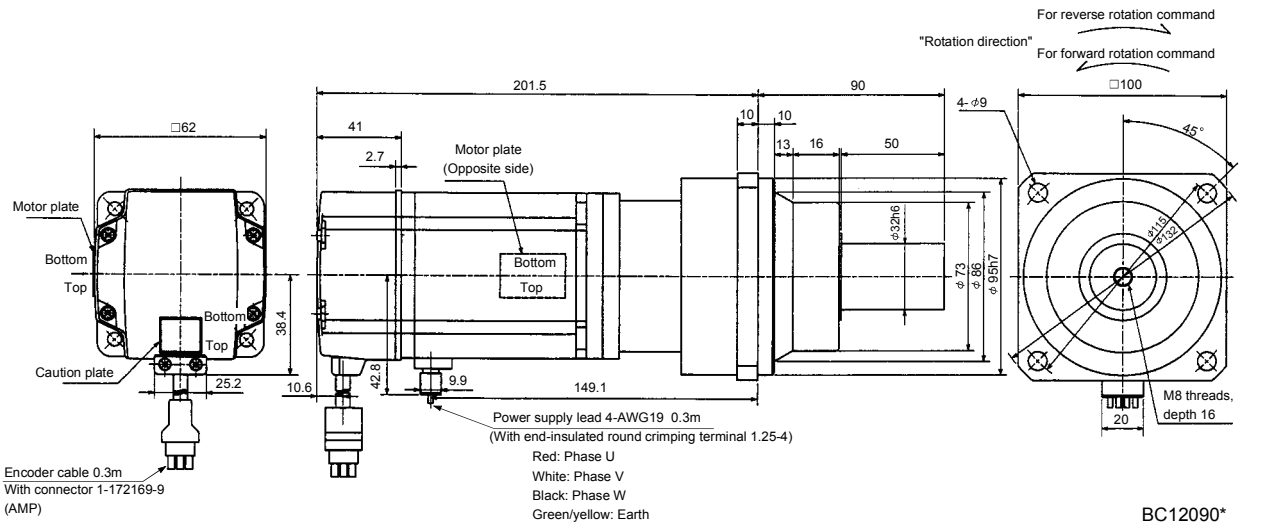


Note: The dimensions without tolerances are reference dimensions.

BC12070*

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-KF43G1	400	K10020	1/20	253/5000	0.970	60min. max.	5.5

(Note)[Unit: mm]



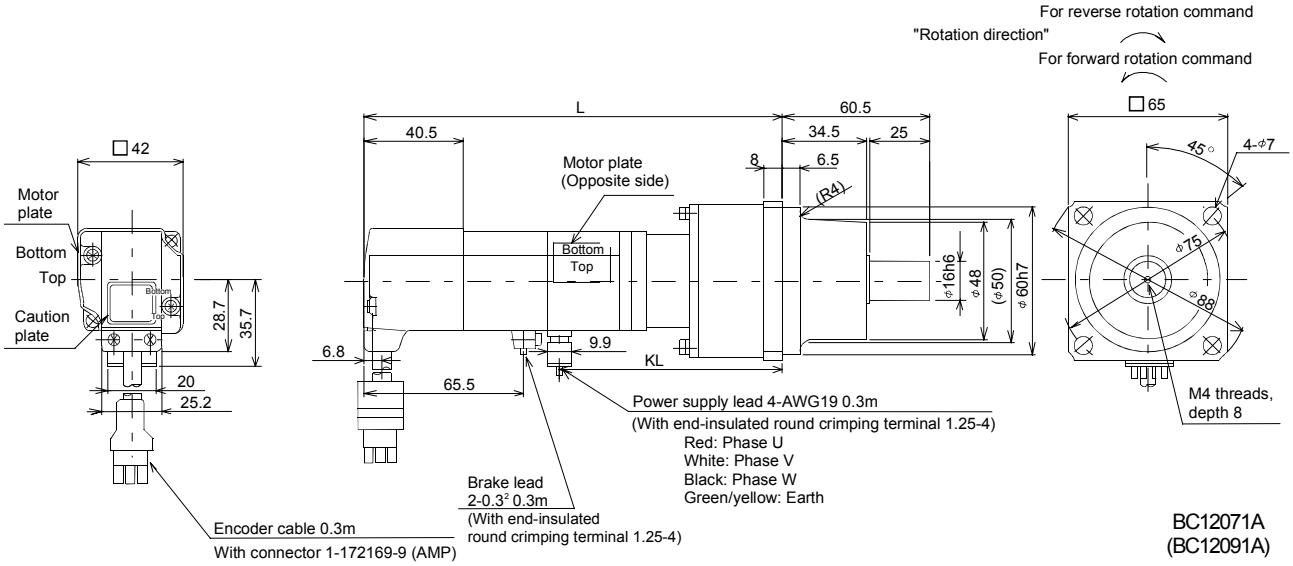
Note: The dimensions without tolerances are reference dimensions.

BC12090*

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF053BG1	50	154	74	0.32	K6505	1/5(9/44)	0.058	60min. max.	1.8
HC-MF053BG1	50	172	92	0.32	K6512	1/12(49/576)	0.080	60min. max.	2.2
HC-MF053BG1	50	172	92	0.32	K6520	1/20(25/484)	0.062	60min. max.	2.2
HC-KF053BG1	50	154	74	0.32	K6505	1/5(9/44)	0.093	60min. max.	1.8
HC-KF053BG1	50	172	92	0.32	K6512	1/12(49/576)	0.115	60min. max.	2.2
HC-KF053BG1	50	172	92	0.32	K6520	1/20(25/484)	0.097	60min. max.	2.2

(Note)[Unit: mm]

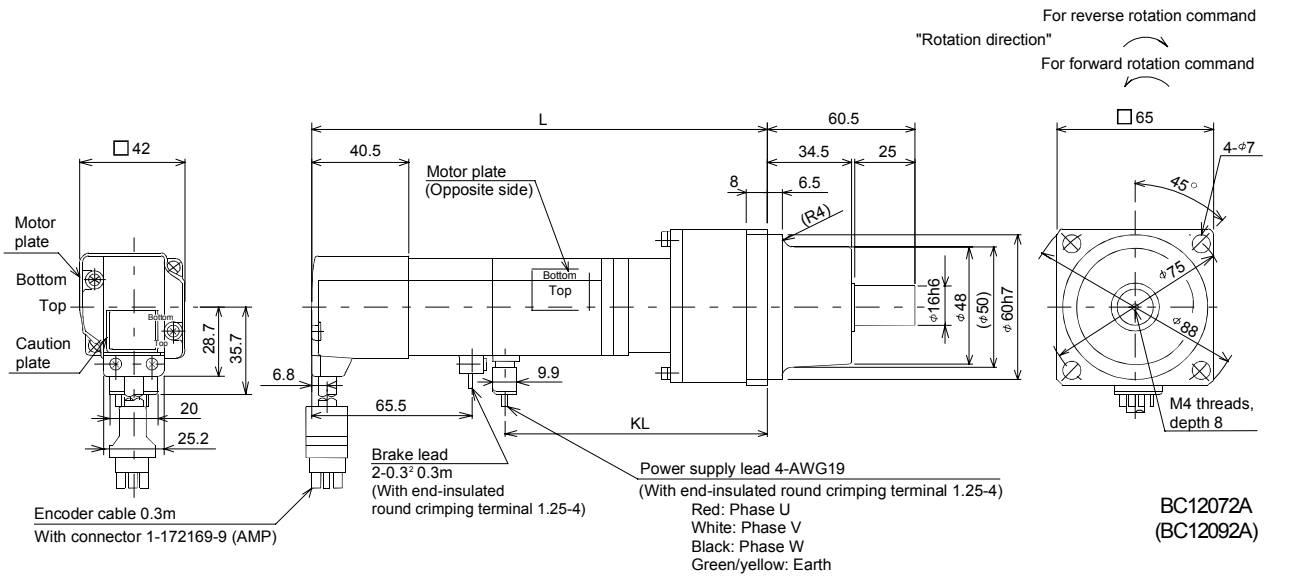


BC12071A
(BC12091A)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF13BG1	100	169	89	0.32	K6505	1/5(9/44)	0.069	60min. max.	1.9
HC-MF13BG1	100	187	107	0.32	K6512	1/12(49/576)	0.091	60min. max.	2.3
HC-MF13BG1	100	187	107	0.32	K6520	1/20(25/484)	0.073	60min. max.	2.3
HC-KF13BG1	100	169	89	0.32	K6505	1/5(9/44)	0.124	60min. max.	1.9
HC-KF13BG1	100	187	107	0.32	K6512	1/12(49/576)	0.146	60min. max.	2.3
HC-KF13BG1	100	187	107	0.32	K6520	1/20(25/484)	0.128	60min. max.	2.3

(Note)[Unit: mm]



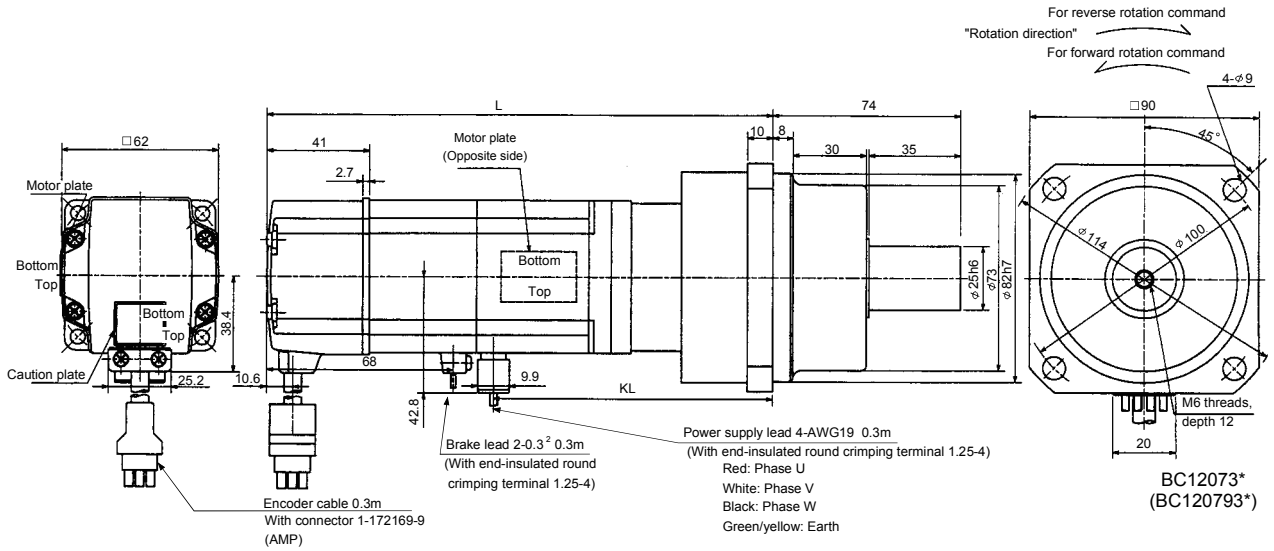
BC12072A
(BC12092A)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
		L	KL					
HC-MF23BG1	200	185	102.6	K9005	1/5(19/96)	0.289	3.9	1.3
HC-MF23BG1	200	205	122.6	K9012	1/12(25/288)	0.333	4.5	1.3
HC-MF23BG1	200	205	122.6	K9020	1/20(253/5000)	0.306	4.5	1.3
HC-KF23BG1	200	185	102.6	K9005	1/5(19/96)	0.470	3.9	1.3
HC-KF23BG1	200	205	122.6	K9012	1/12(25/288)	0.520	4.5	1.3
HC-KF23BG1	200	205	122.6	K9020	1/20(253/5000)	0.490	4.5	1.3

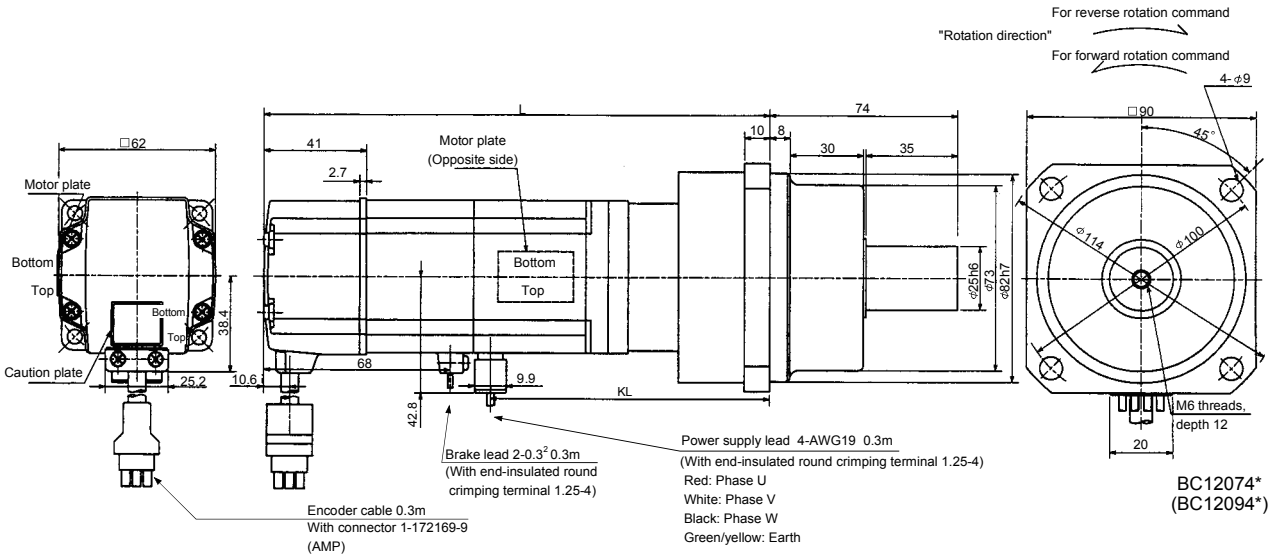
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL					
HC-MF43BG1	400	210	125.6	1.3	K9005	1/5(19/96)	0.344	4.4
HC-MF43BG1	400	230	145.6	1.3	K9012	1/12(25/288)	0.388	5.0
HC-KF43BG1	400	210	125.6	1.3	K9005	1/5(19/96)	0.660	4.4
HC-KF43BG1	400	230	145.6	1.3	K9012	1/12(25/288)	0.710	5.0

(Note)[Unit: mm]



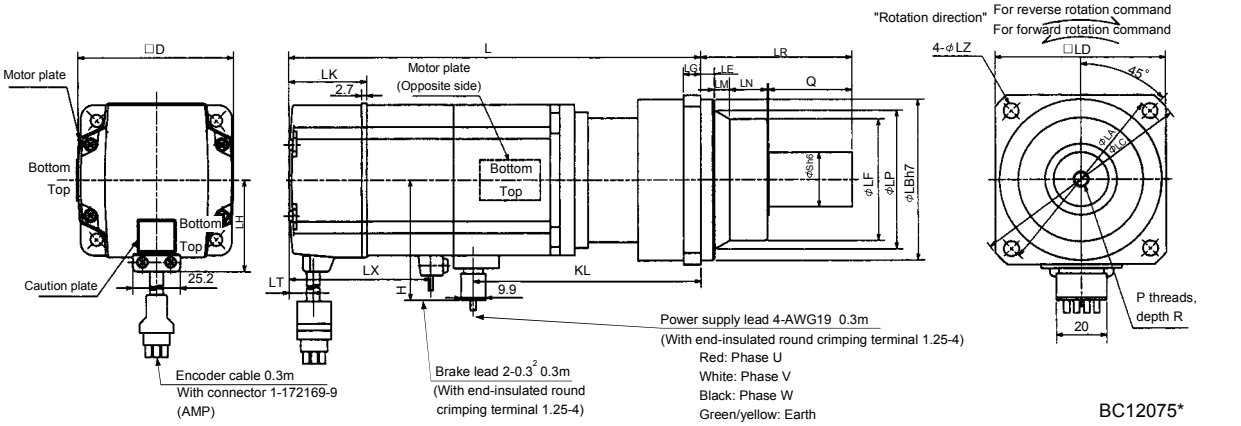
Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-MF43BG1	400	1.3	K10020	1/20	253/5000	0.700	60min. max.	6.1
HC-MF73BG1	750	2.4	K10005	1/5	1/5	1.145	60min. max.	7.2
HC-MF73BG1	750	2.4	K10012	1/12	525/6048	1.811	60min. max.	8.3
HC-MF73BG1	750	2.4	K12020	1/20	625/12544	1.875	60min. max.	11.1

Model	Output [W]	Variable Dimensions																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MF43BG1	400	62	38.4	41	10.6	68	42.8	115	95	132	100	10	73	10	13	16	86	233.5	90	149.1	9	50	32	M8	16
HC-MF73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	242.5	90	151.7	9	50	32	M8	16
HC-MF73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	264.5	90	173.7	9	50	32	M8	16
HC-MF73BG1	750	82	48.7	39	11	72	58.1	140	115	162	120	12	90	15	13	20	104	277.5	106	186.7	14	60	40	M10	20

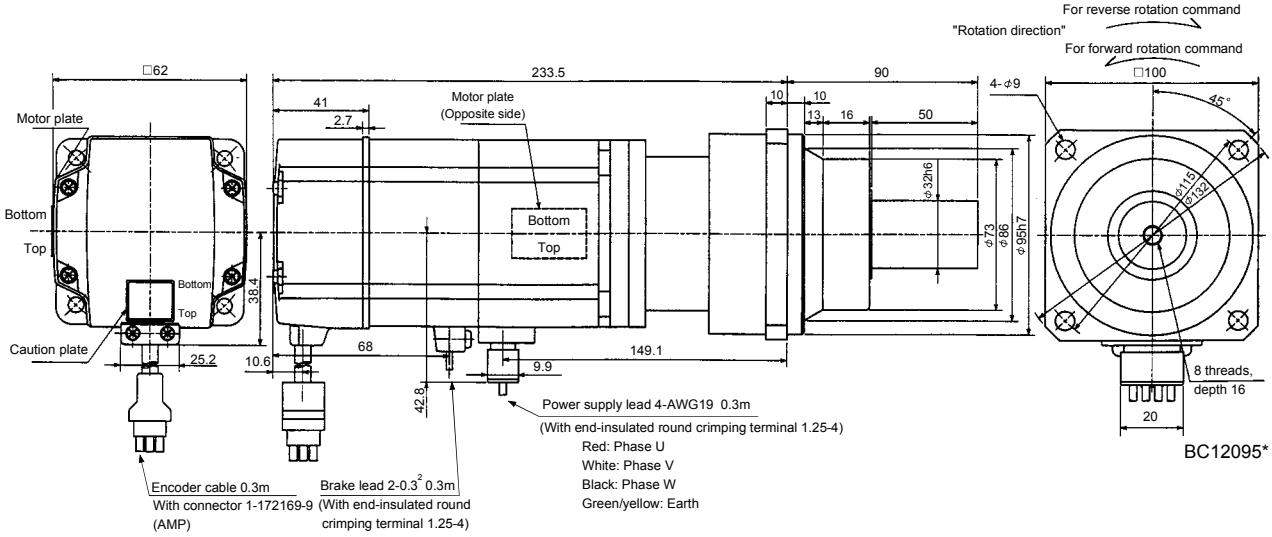
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-KF43BG1	400	1.3	K10020	1/20	253/5000	1.02	60min. max.	6.1

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

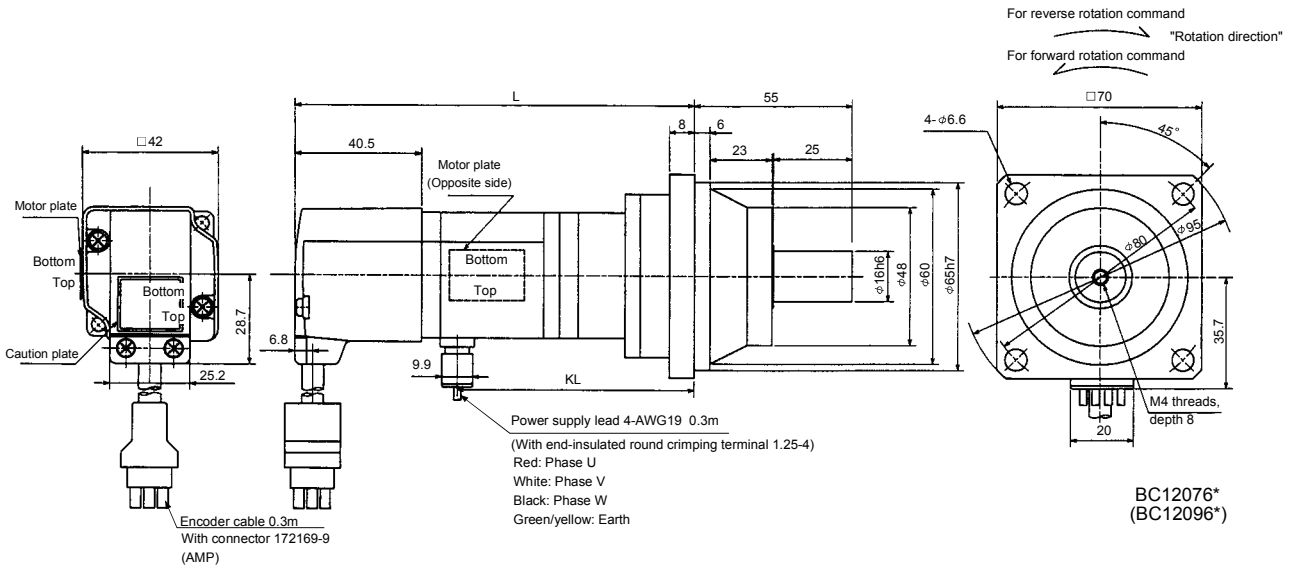
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF053G2	50	130	78	BK1-05B-A5MEKA	1/5	0.067	3 min. max.	1.4
HC-MF053G2	50	146	94	BK1-09B-A5MEKA	1/9	0.060	3 min. max.	1.7
HC-MF053G2	50	146	94	BK1-20B-A5MEKA	1/20	0.069	3 min. max.	1.8
HC-MF053G2	50	146	94	BK1-29B-A5MEKA	1/29	0.057	3 min. max.	1.8
HC-KF053G2	50	130	78	BK1-05B-A5MEKA	1/5	0.101	3 min. max.	1.4
HC-KF053G2	50	146	94	BK1-09B-A5MEKA	1/9	0.095	3 min. max.	1.7
HC-KF053G2	50	146	94	BK1-20B-A5MEKA	1/20	0.104	3 min. max.	1.8
HC-KF053G2	50	146	94	BK1-29B-A5MEKA	1/29	0.092	3 min. max.	1.8

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

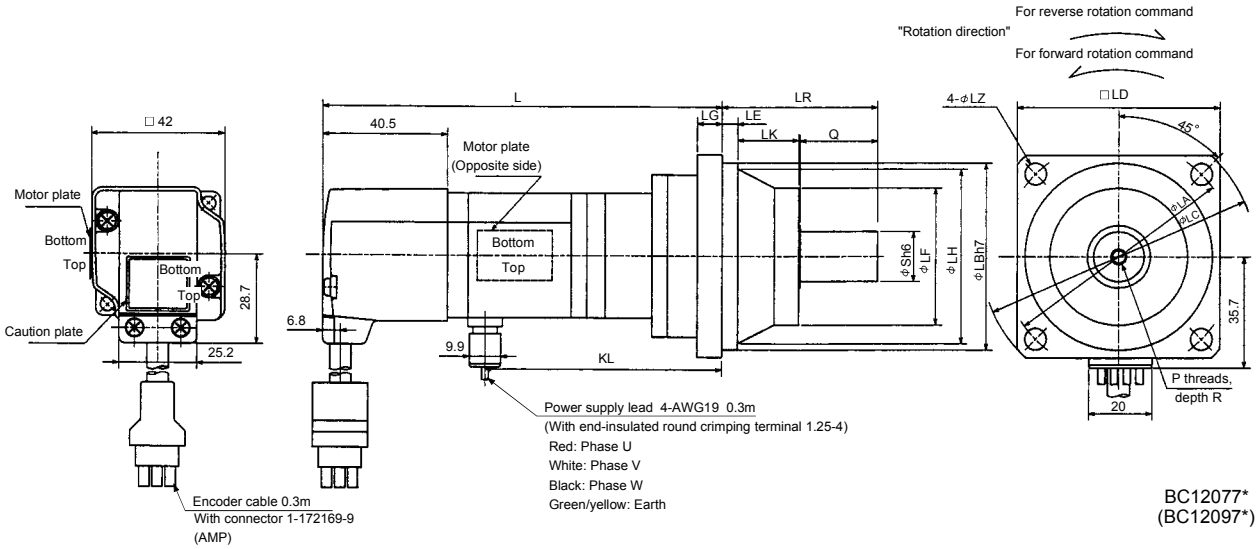
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF13G2	100	BK1-05B-01MEKA	1/5	0.078	3 min. max.	1.5
HC-MF13G2	100	BK1-09B-01MEKA	1/9	0.072	3 min. max.	1.8
HC-MF13G2	100	BK2-20B-01MEKA	1/20	0.122	3 min. max.	3.0
HC-MF13G2	100	BK2-29B-01MEKA	1/29	0.096	3 min. max.	3.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF13G2	100	80	65	95	70	6	48	8	60	23	145	55	93	6.6	25	16	M4	8
HC-MF13G2	100	80	65	95	70	6	48	8	60	23	161	55	109	6.6	25	16	M4	8
HC-MF13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10
HC-MF13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-KF13G2	100	BK1-05B-01MEKA	1/5	0.132	3 min. max.	1.5
HC-KF13G2	100	BK1-09B-01MEKA	1/9	0.126	3 min. max.	1.8
HC-KF13G2	100	BK2-20B-01MEKA	1/20	0.176	3 min. max.	3.0
HC-KF13G2	100	BK2-29B-01MEKA	1/29	0.150	3 min. max.	3.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF13G2	100	80	65	95	70	6	48	8	60	23	145	55	93	6.6	25	16	M4	8
HC-KF13G2	100	80	65	95	70	6	48	8	60	23	161	55	109	6.6	25	16	M4	8
HC-KF13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10
HC-KF13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10

(Note)[Unit: mm]



BC12077*
(BC12097*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

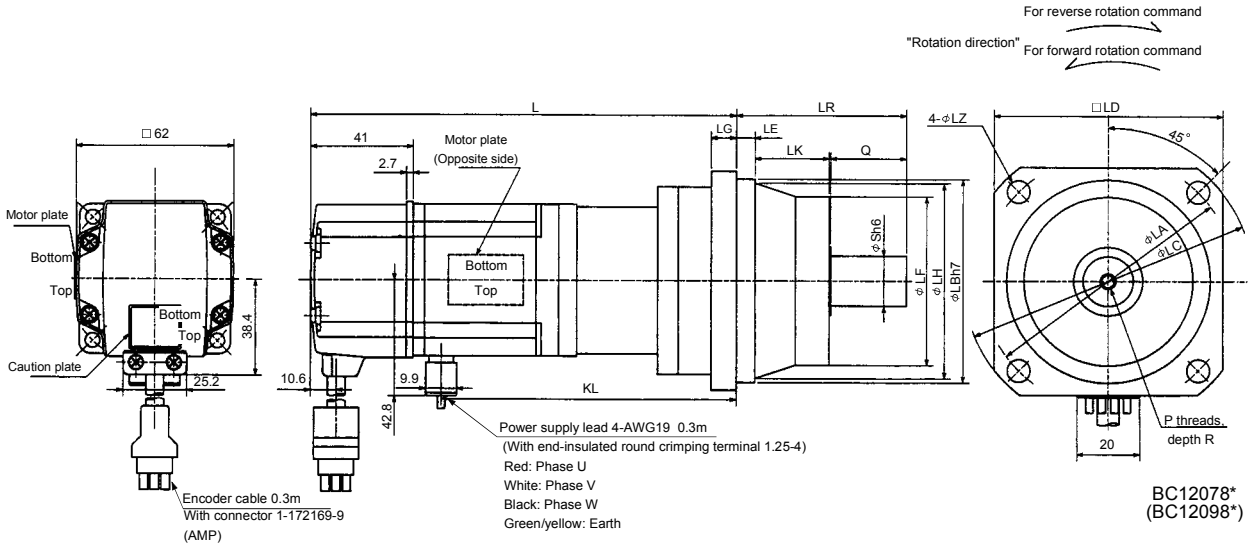
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF23G2	200	BK1-05B-02MEKA	1/5	0.191	2.1
HC-MF23G2	200	BK2-09B-02MEKA	1/9	0.208	3.5
HC-MF23G2	200	BK3-20B-02MEKA	1/20	0.357	5.0
HC-MF23G2	200	BK3-29B-02MEKA	1/29	0.276	5.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF23G2	200	80	65	95	70	6	48	8	60	23	157	55	106.6	6.6	25	16	M4	8
HC-MF23G2	200	100	80	115	85	6	65	10	74	33	175	75	124.6	6.6	35	20	M5	10
HC-MF23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12
HC-MF23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KF23G2	200	BK1-05B-02MEKA	1/5	0.360	2.1
HC-KF23G2	200	BK2-09B-02MEKA	1/9	0.380	3.5
HC-KF23G2	200	BK3-20B-02MEKA	1/20	0.530	5.0
HC-KF23G2	200	BK3-29B-02MEKA	1/29	0.450	5.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF23G2	200	80	65	95	70	6	48	8	60	23	157	55	106.6	6.6	25	16	M4	8
HC-KF23G2	200	100	80	115	85	6	65	10	74	33	175	75	124.6	6.6	35	20	M5	10
HC-KF23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12
HC-KF23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

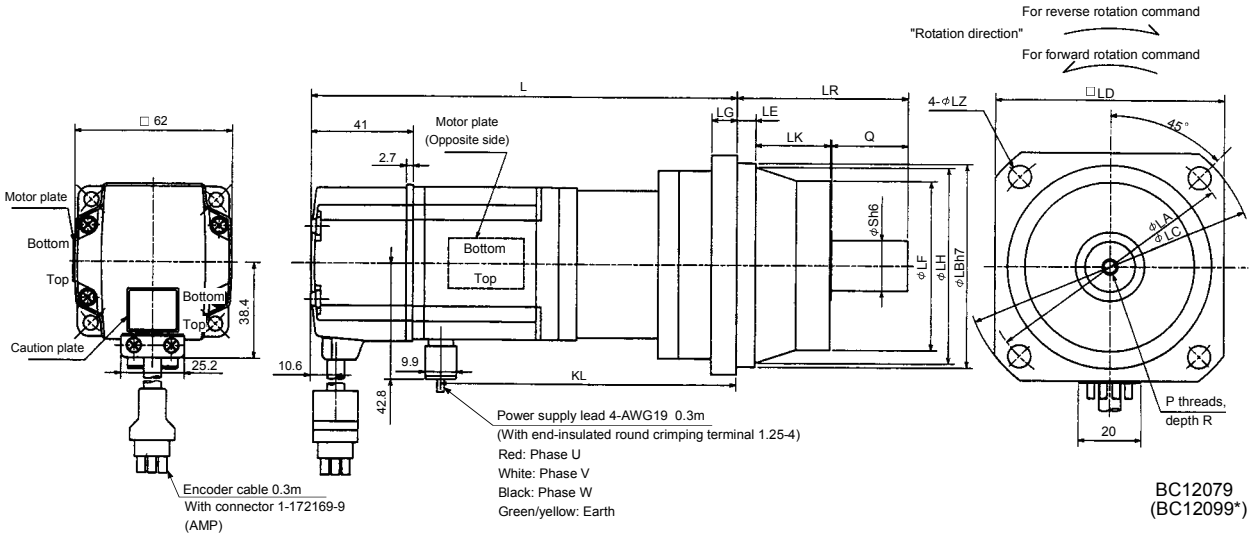
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF43G2	400	BK2-05B-04MEKA	1/5	0.295	3.7
HC-MF43G2	400	BK3-09B-04MEKA	1/9	0.323	5.3
HC-MF43G2	400	BK4-20B-04MEKA	1/20	0.426	7.5
HC-MF43G2	400	BK4-29B-04MEKA	1/29	0.338	7.5

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF43G2	400	100	80	115	85	6	65	10	74	33	184	75	131.6	6.6	35	20	M5	10
HC-MF43G2	400	115	95	135	100	8	75	10	85	35	205	85	152.6	9	40	25	M6	12
HC-MF43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16
HC-MF43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KF43G2	400	BK2-05B-04MEKA	1/5	0.610	3.7
HC-KF43G2	400	BK3-09B-04MEKA	1/9	0.640	5.3
HC-KF43G2	400	BK4-20B-04MEKA	1/20	0.740	7.5
HC-KF43G2	400	BK4-29B-04MEKA	1/29	0.660	7.5

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF43G2	400	100	80	115	85	6	65	10	74	33	184	75	131.6	6.6	35	20	M5	10
HC-KF43G2	400	115	95	135	100	8	75	10	85	35	205	85	152.6	9	40	25	M6	12
HC-KF43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16
HC-KF43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16

(Note)[Unit: mm]



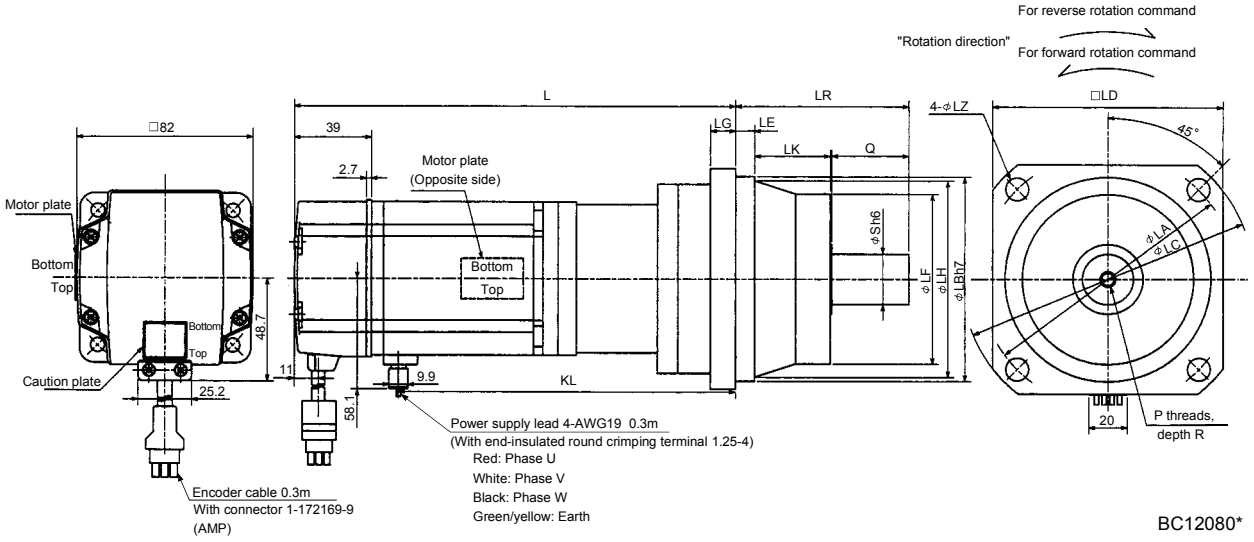
Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73G2	750	BK3-05B-08MEKA	1/5	0.973	6.3
HC-MF73G2	750	BK4-09B-08MEKA	1/9	0.980	8.6
HC-MF73G2	750	BK5-20B-08MEKA	1/20	1.016	12.0
HC-MF73G2	750	BK5-29B-08MEKA	1/29	0.910	12.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF73G2	750	115	95	135	100	8	75	10	85	35	212	85	156.7	9	40	25	M6	12
HC-MF73G2	750	135	110	155	115	8	90	12	100	40	248	100	184.7	11	50	32	M8	16
HC-MF73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20
HC-MF73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20

(Note)[Unit: mm]

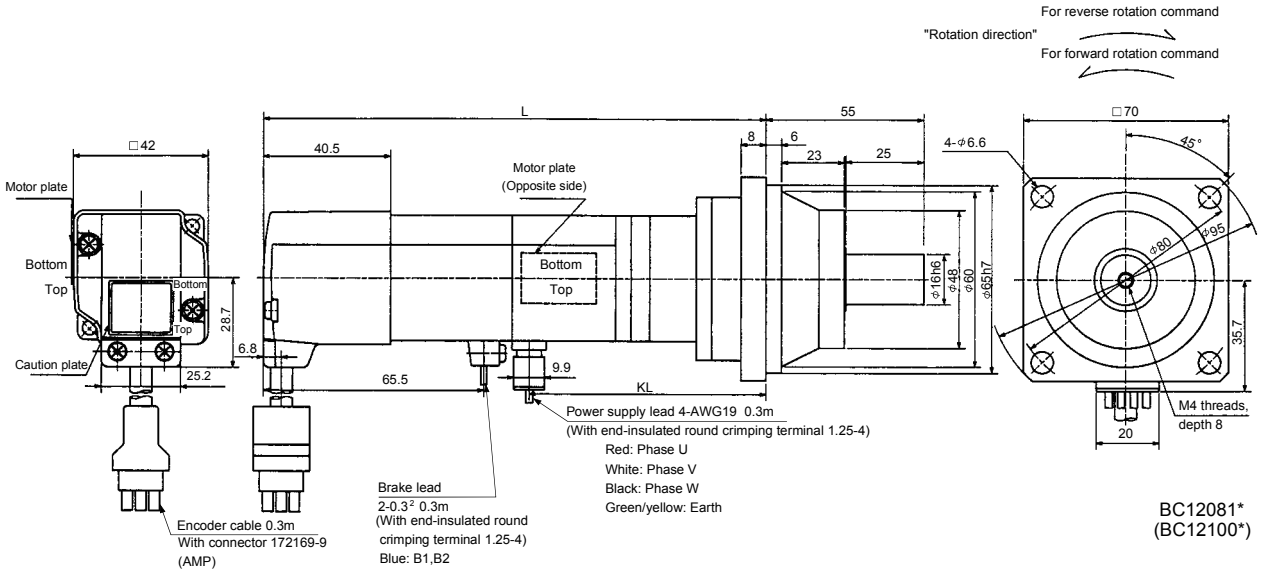


Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
		L	KL						
HC-MF053BG2	50	158	78	0.32	BK1-05B-A5MEKA	1/5	0.070	3 min. max.	1.8
HC-MF053BG2	50	174	94	0.32	BK1-09B-A5MEKA	1/9	0.063	3 min. max.	2.1
HC-MF053BG2	50	174	94	0.32	BK1-20B-A5MEKA	1/20	0.072	3 min. max.	2.2
HC-MF053BG2	50	174	94	0.32	BK1-29B-A5MEKA	1/29	0.060	3 min. max.	2.2
HC-KF053BG2	50	158	78	0.32	BK1-05B-A5MEKA	1/5	0.104	3 min. max.	1.8
HC-KF053BG2	50	174	94	0.32	BK1-09B-A5MEKA	1/9	0.098	3 min. max.	2.1
HC-KF053BG2	50	174	94	0.32	BK1-20B-A5MEKA	1/20	0.107	3 min. max.	2.2
HC-KF053BG2	50	174	94	0.32	BK1-29B-A5MEKA	1/29	0.095	3 min. max.	2.2

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

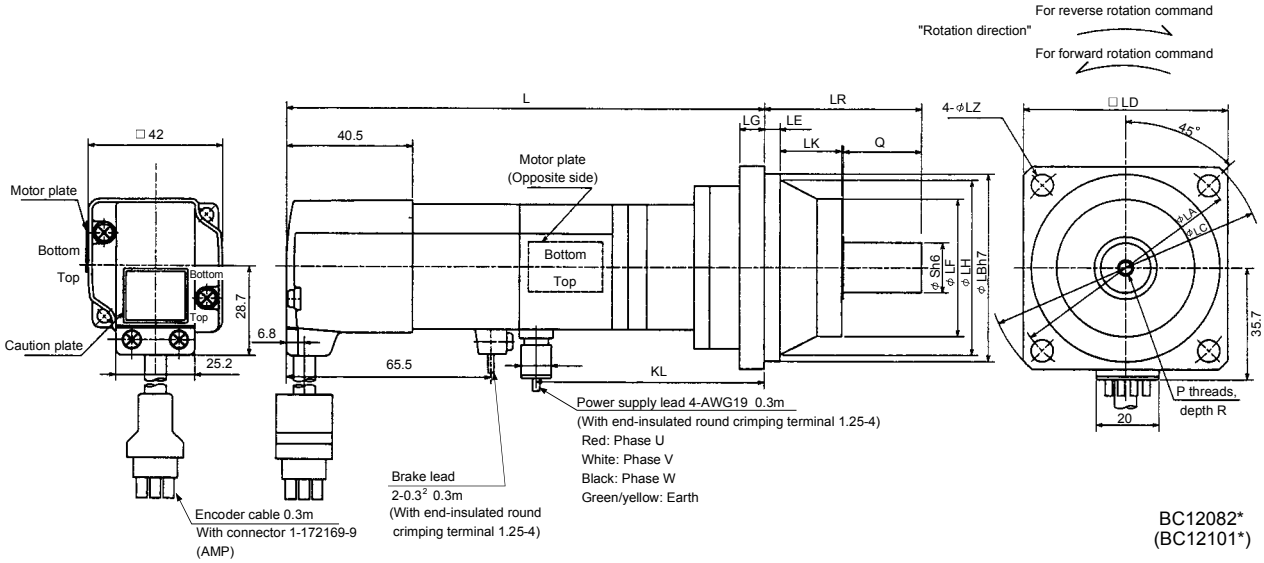
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MF13BG2	100	0.32	BK1-05B-01MEKA	1/5	0.080	3 min. max.	1.9
HC-MF13BG2	100	0.32	BK1-09B-01MEKA	1/9	0.074	3 min. max.	2.2
HC-MF13BG2	100	0.32	BK2-20B-01MEKA	1/20	0.124	3 min. max.	3.4
HC-MF13BG2	100	0.32	BK2-29B-01MEKA	1/29	0.098	3 min. max.	3.4

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF13BG2	100	80	65	95	70	6	48	8	60	23	173	55	93	6.6	25	16	M4	8
HC-MF13BG2	100	80	65	95	70	6	48	8	60	23	189	55	109	6.6	25	16	M4	8
HC-MF13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10
HC-MF13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-KF13BG2	100	0.32	BK1-05B-01MEKA	1/5	0.135	3 min. max.	1.9
HC-KF13BG2	100	0.32	BK1-09B-01MEKA	1/9	0.129	3 min. max.	2.2
HC-KF13BG2	100	0.32	BK2-20B-01MEKA	1/20	0.179	3 min. max.	3.4
HC-KF13BG2	100	0.32	BK2-29B-01MEKA	1/29	0.153	3 min. max.	3.4

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF13BG2	100	80	65	95	70	6	48	8	60	23	173	55	93	6.6	25	16	M4	8
HC-KF13BG2	100	80	65	95	70	6	48	8	60	23	189	55	109	6.6	25	16	M4	8
HC-KF13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10
HC-KF13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

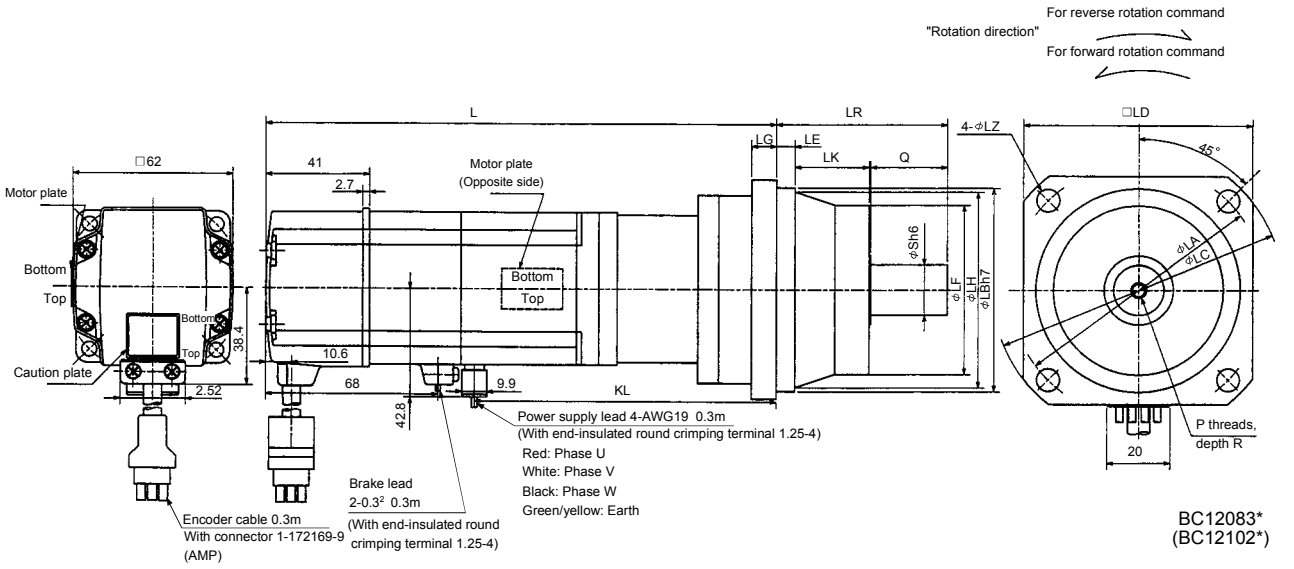
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF23BG2	200	1.3	BK1-05B-02MEKA	1/5	0.239	2.7
HC-MF23BG2	200	1.3	BK2-09B-02MEKA	1/9	0.256	4.1
HC-MF23BG2	200	1.3	BK3-20B-02MEKA	1/20	0.405	5.6
HC-MF23BG2	200	1.3	BK3-29B-02MEKA	1/29	0.324	5.6

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF23BG2	200	80	65	95	70	6	48	8	60	23	189	55	106.6	6.6	25	16	M4	8
HC-MF23BG2	200	100	80	115	85	6	65	10	74	33	207	75	124.6	6.6	35	20	M5	10
HC-MF23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12
HC-MF23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KF23BG2	200	1.3	BK1-05B-02MEKA	1/5	0.410	2.7
HC-KF23BG2	200	1.3	BK2-09B-02MEKA	1/9	0.430	4.1
HC-KF23BG2	200	1.3	BK3-20B-02MEKA	1/20	0.580	5.6
HC-KF23BG2	200	1.3	BK3-29B-02MEKA	1/29	0.500	5.6

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF23BG2	200	80	65	95	70	6	48	8	60	23	189	55	106.6	6.6	25	16	M4	8
HC-KF23BG2	200	100	80	115	85	6	65	10	74	33	207	75	124.6	6.6	35	20	M5	10
HC-KF23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12
HC-KF23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

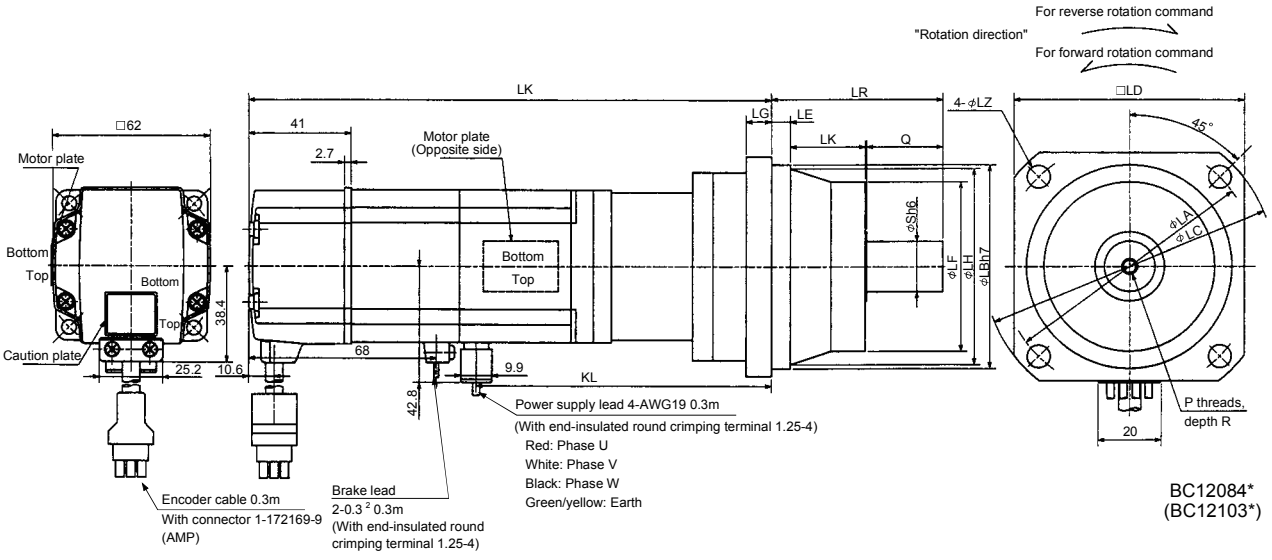
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF43BG2	400	1.3	BK2-05B-04MEKA	1/5	0.344	4.3
HC-MF43BG2	400	1.3	BK3-09B-04MEKA	1/9	0.372	5.9
HC-MF43BG2	400	1.3	BK4-20B-04MEKA	1/20	0.475	8.1
HC-MF43BG2	400	1.3	BK4-29B-04MEKA	1/29	0.386	8.1

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF43BG2	400	100	80	115	85	6	65	10	74	33	216	75	131.6	6.6	35	20	M5	10
HC-MF43BG2	400	115	95	135	100	8	75	10	85	35	237	85	152.6	9	40	25	M6	12
HC-MF43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16
HC-MF43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KF43BG2	400	1.3	BK2-05B-04MEKA	1/5	0.660	4.3
HC-KF43BG2	400	1.3	BK3-09B-04MEKA	1/9	0.690	5.9
HC-KF43BG2	400	1.3	BK4-20B-04MEKA	1/20	0.790	8.1
HC-KF43BG2	400	1.3	BK4-29B-04MEKA	1/29	0.710	8.1

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF43BG2	400	100	80	115	85	6	65	10	74	33	216	75	131.6	6.6	35	20	M5	10
HC-KF43BG2	400	115	95	135	100	8	75	10	85	35	237	85	152.6	9	40	25	M6	12
HC-KF43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16
HC-KF43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16

(Note)[Unit: mm]



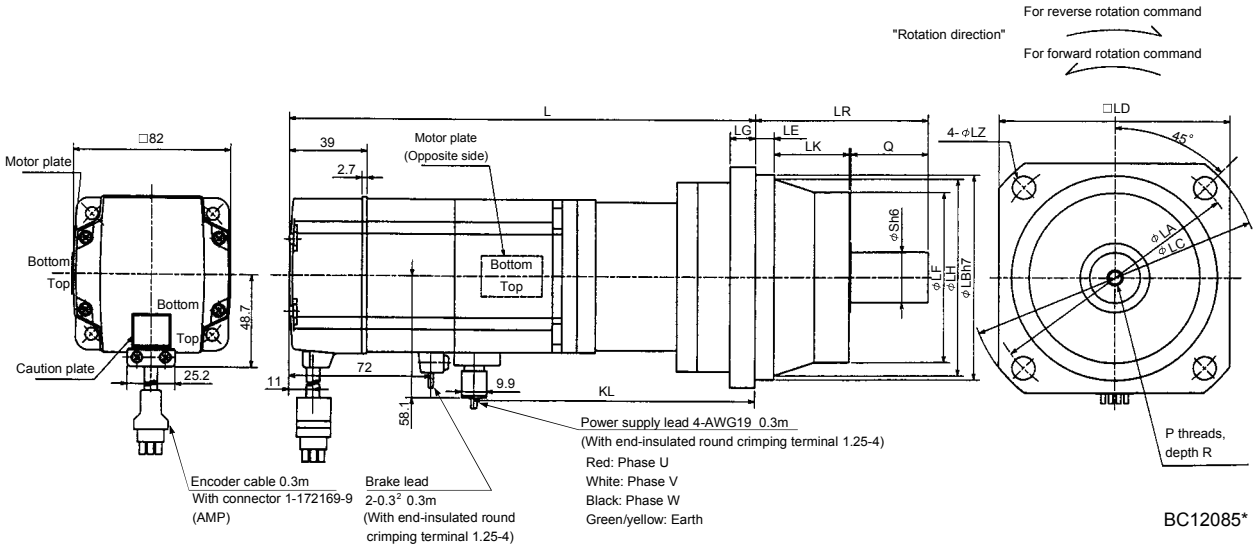
Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73BG2	750	2.4	BK3-05B-08MEKA	1/5	1.098	7.3
HC-MF73BG2	750	2.4	BK4-09B-08MEKA	1/9	1.105	9.6
HC-MF73BG2	750	2.4	BK5-20B-08MEKA	1/20	1.141	13.0
HC-MF73BG2	750	2.4	BK5-29B-08MEKA	1/29	1.035	13.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF73BG2	750	115	95	135	100	8	75	10	85	35	247.5	85	156.7	9	40	25	M6	12
HC-MF73BG2	750	135	110	155	115	8	90	12	100	40	275.5	100	184.7	11	50	32	M8	16
HC-MF73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20
HC-MF73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20

(Note)[Unit: mm]



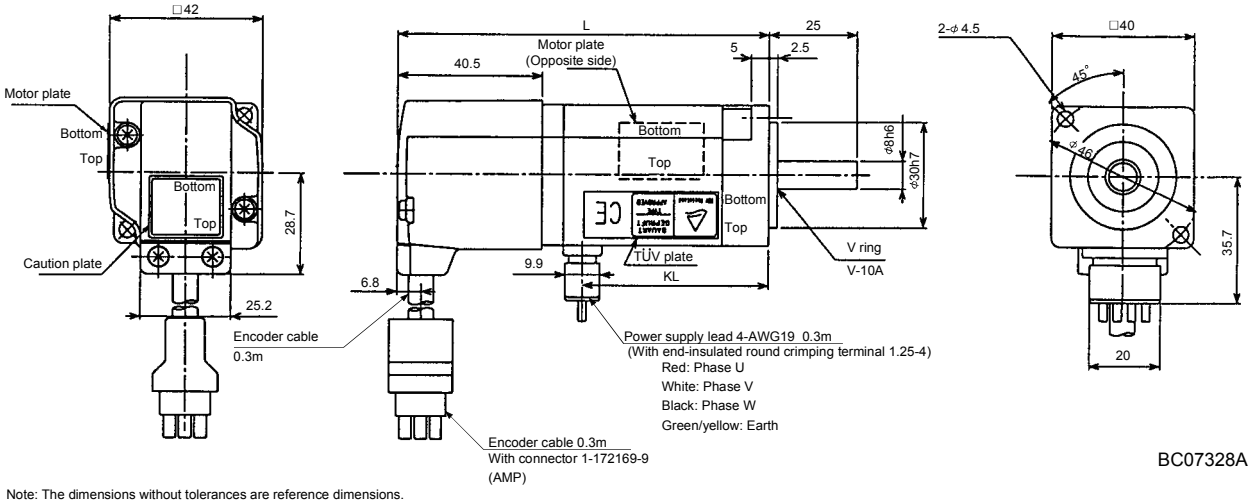
Note: The dimensions without tolerances are reference dimensions.

(5) EN・UL/C-UL Standard-compliant models

(a) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL		
HC-MF053-UE	50	89.5	37.5	0.019	0.5
HC-MF13-UE	100	104.5	52.5	0.03	0.6
HC-KF053-UE	50	89.5	37.5	0.054	0.5
HC-KF13-UE	100	104.5	52.5	0.085	0.6

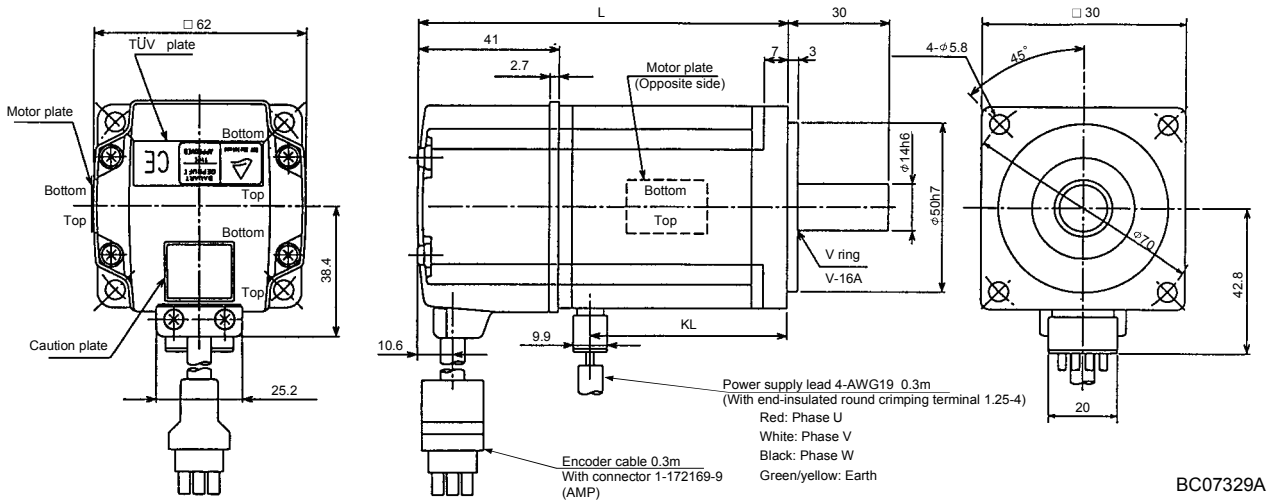
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL		
HC-MF23-UE	200	108.5	58	0.09	1.2
HC-MF43-UE	400	133.5	81	0.14	1.7
HC-KF23-UE	200	108.5	58	0.270	1.2
HC-KF43-UE	400	133.5	81	0.470	1.7

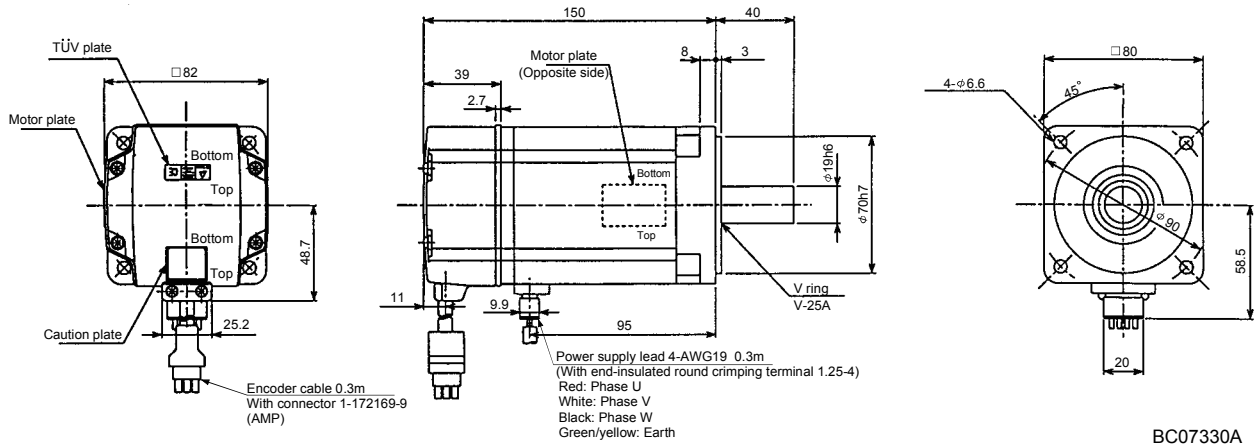
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73-UE	750	0.675	3.1

(Note)[Unit: mm]



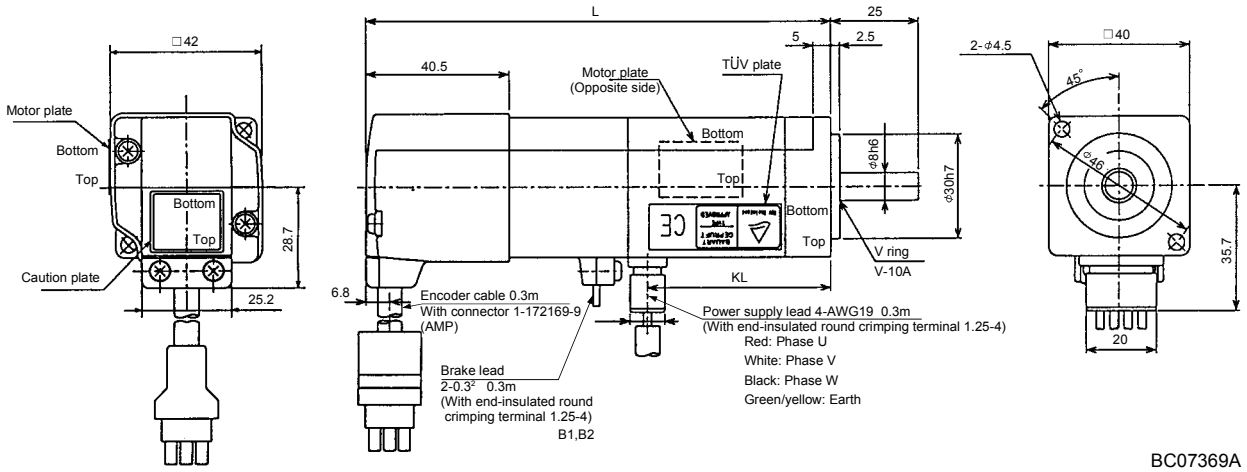
BC07330A

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF053B-UE	50	117.5	37.5	0.32	0.022	0.9
HC-MF13B-UE	100	132.5	52.5		0.032	1
HC-KF053B-UE	50	117.5	37.5		0.057	0.9
HC-KF13B-UE	100	132.5	52.5		0.088	1

(Note)[Unit: mm]



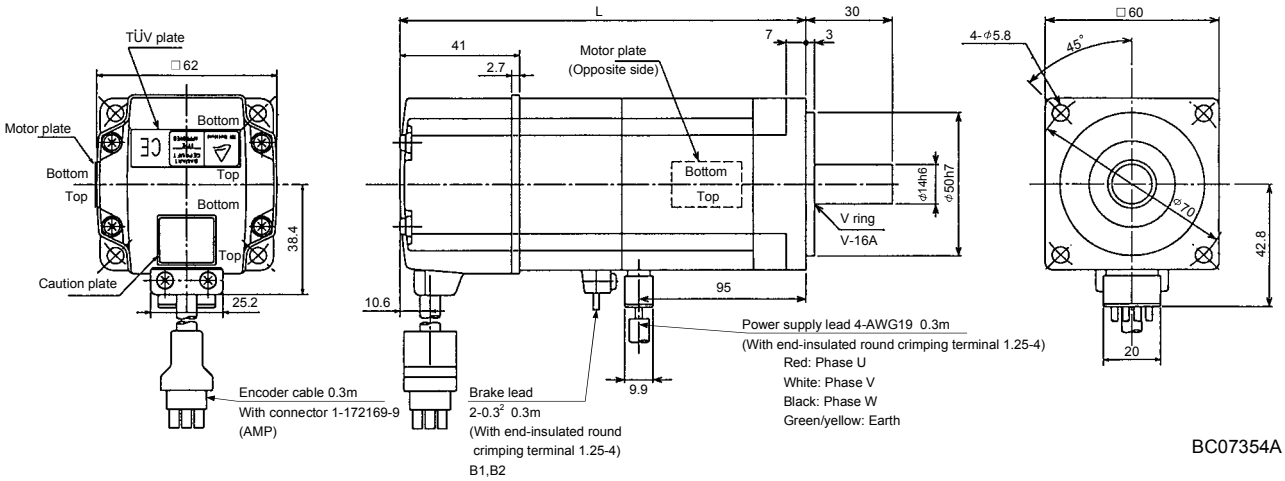
BC07369A

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-MF23B-UE	200	140.5	58	1.3	0.136	1.7
HC-MF43B-UE	400	165.5	81		0.191	2.2
HC-KF23B-UE	200	140.5	58		0.320	1.7
HC-KF43B-UE	400	165.5	81		0.520	2.2

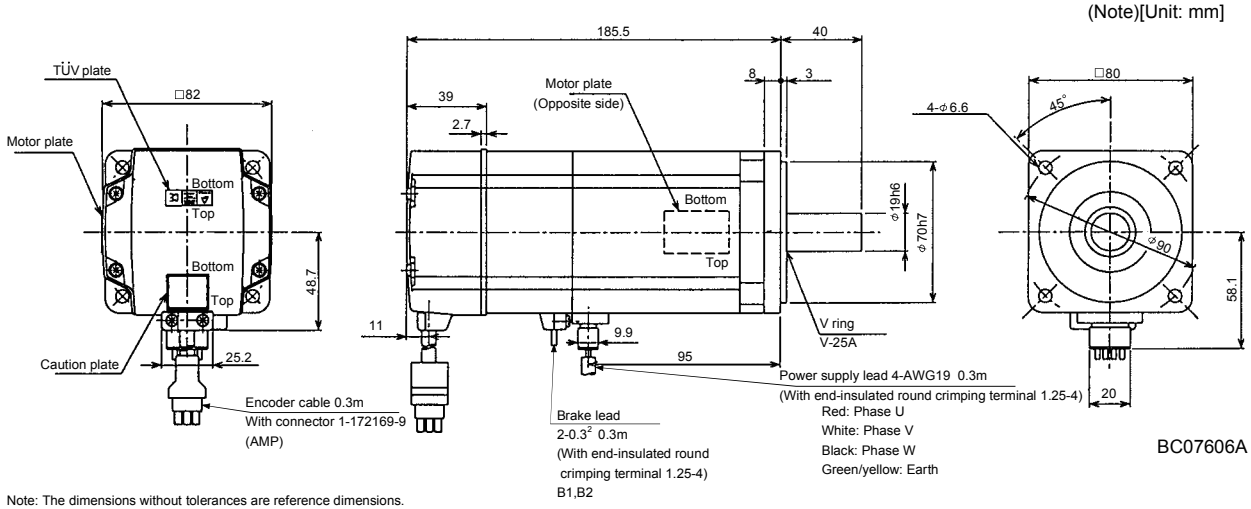
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MF73B-UE	750	2.4	0.75	4.2

(Note)[Unit: mm]



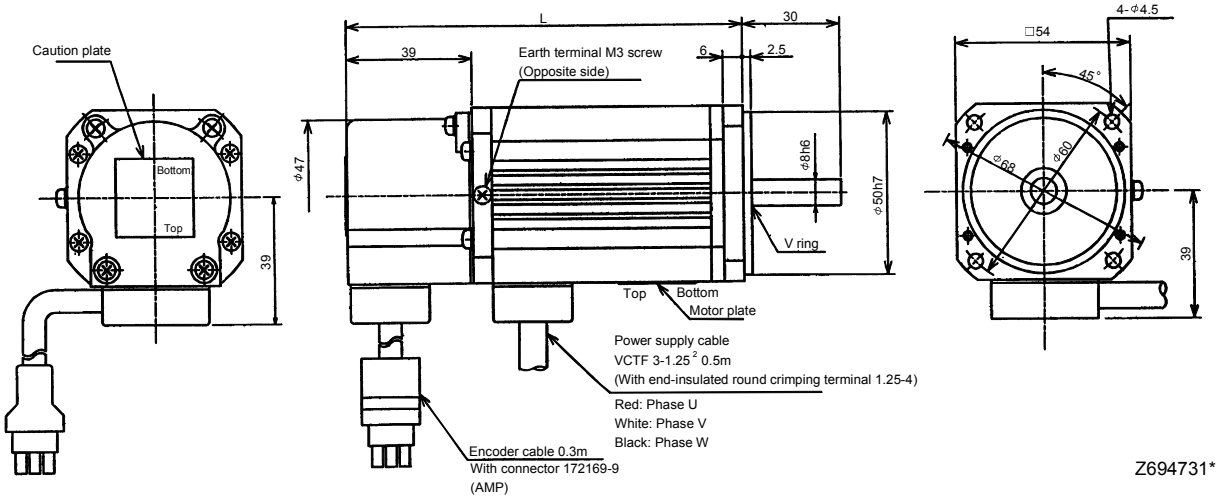
Note: The dimensions without tolerances are reference dimensions.

7.1.2 HA-FF series

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions L	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF053	50	106	0.063	1.3
HA-FF13	100	123	0.10	1.5

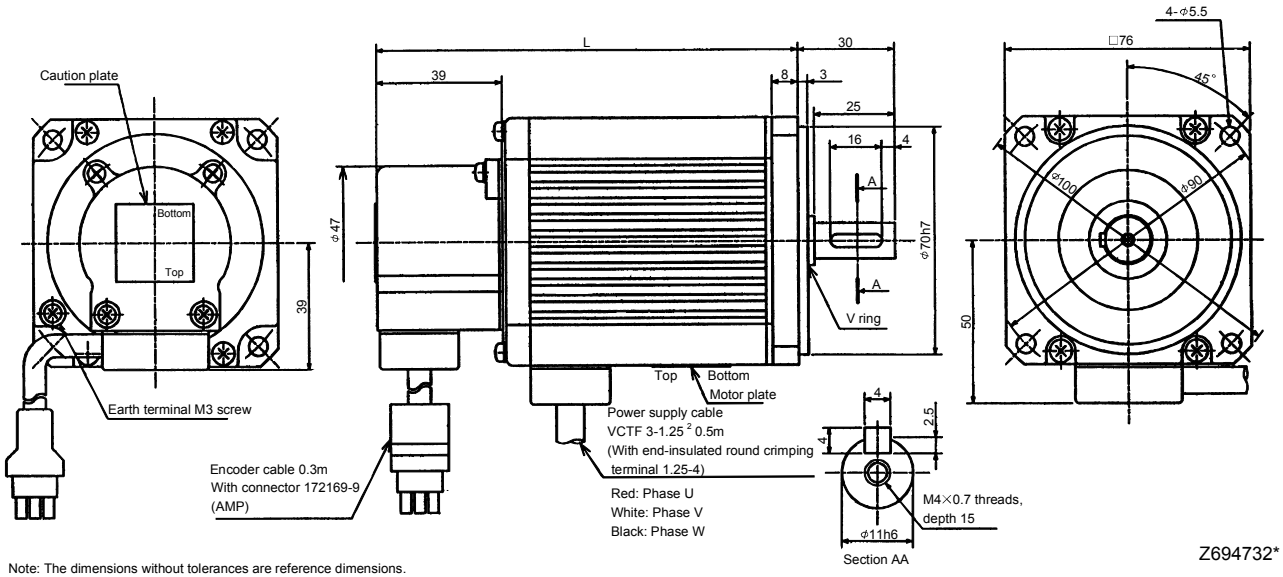
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF23	200	130.5	0.35	2.3
HA-FF33	300	148	0.5	2.6

(Note)[Unit: mm]

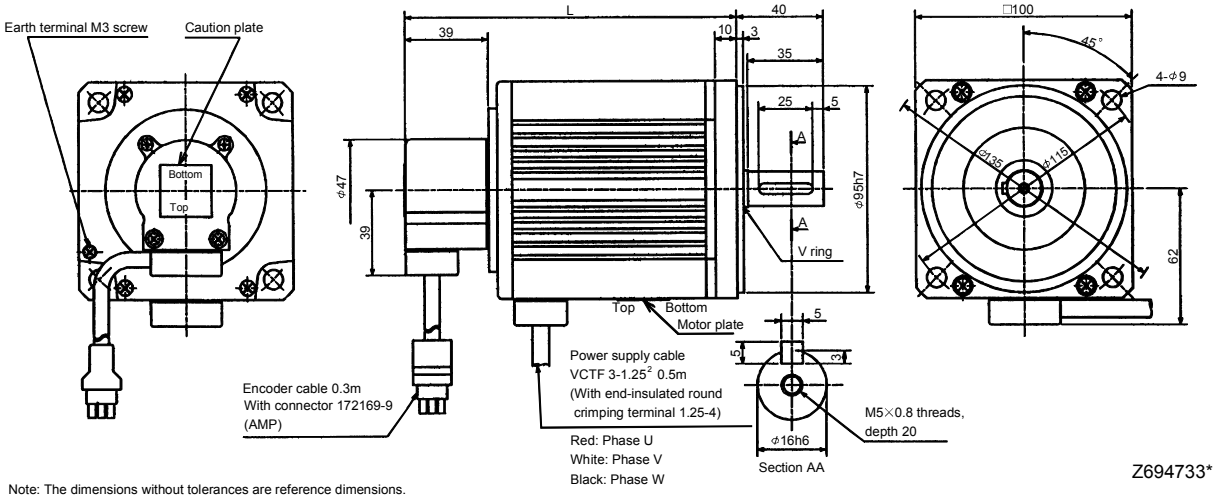


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions L	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF43	400	154.5	0.98	4.2
HA-FF63	600	169.5	1.2	4.8

(Note)[Unit: mm]



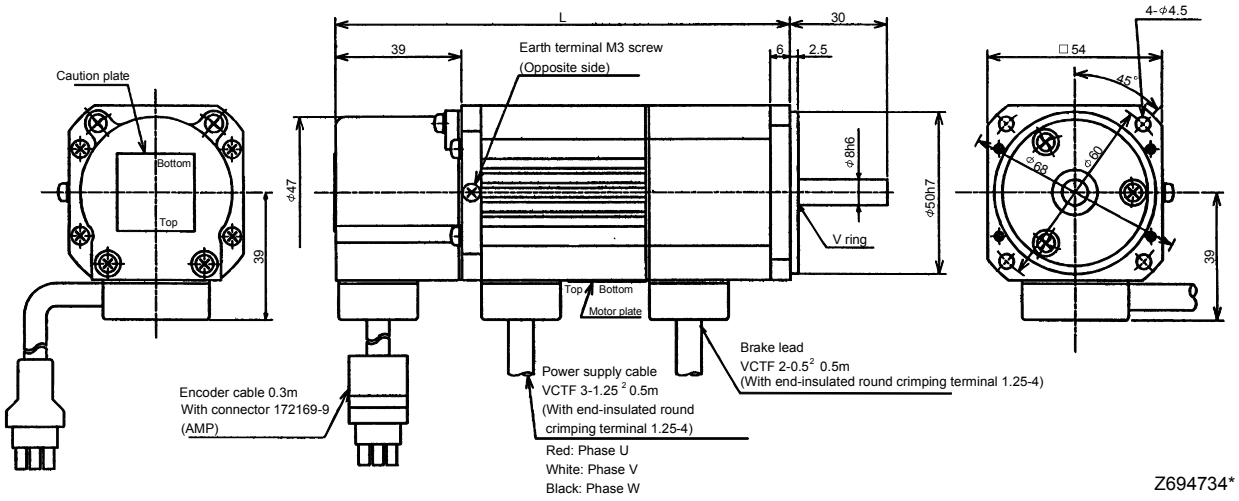
Z694733*

Note: The dimensions without tolerances are reference dimensions.

(2) Without electromagnetic brake

Model	Output [W]	Variable Dimensions L	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF053B	50	141	0.39	0.08	1.6
HA-FF13B	100	158	0.39	0.11	1.8

(Note)[Unit: mm]



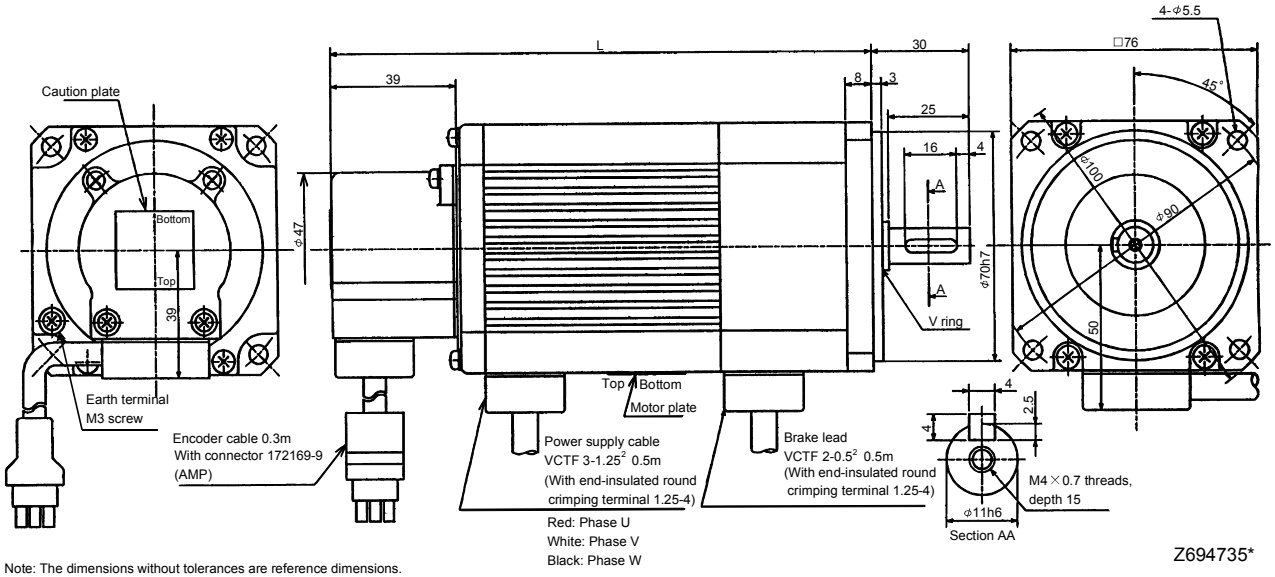
Z694734*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions L	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF23B	200	168	1.2	0.48	2.9
HA-FF33B	300	185.5	1.2	0.63	3.2

(Note)[Unit: mm]

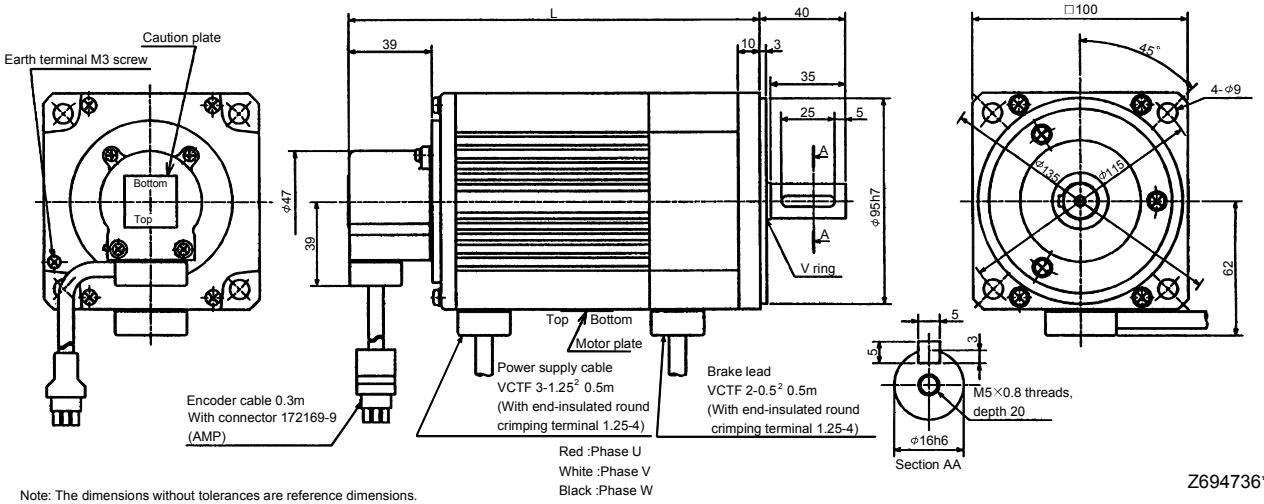


Z694735*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF43B	400	191.5	2.3	1.33	5.0
HA-FF63B	600	206.5	2.3	1.55	5.6

(Note)[Unit: mm]



Z694736*

Note: The dimensions without tolerances are reference dimensions.

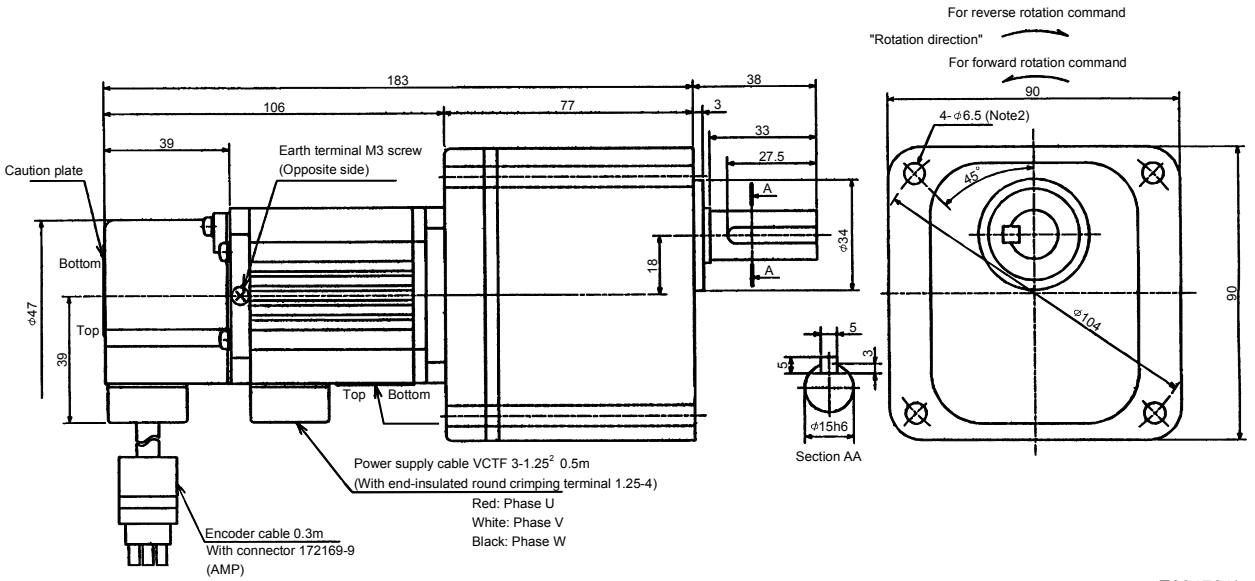
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF053G1	50	GR-S-10	1/5(9/44)	0.068	40min. to 1.5°	2.5	Same as that of motor shaft
			1/10(3/29)				
			1/20(99/1972)	0.063			Opposite to that of motor shaft
			1/30(144/4205)				

(Note1)[Unit: mm]

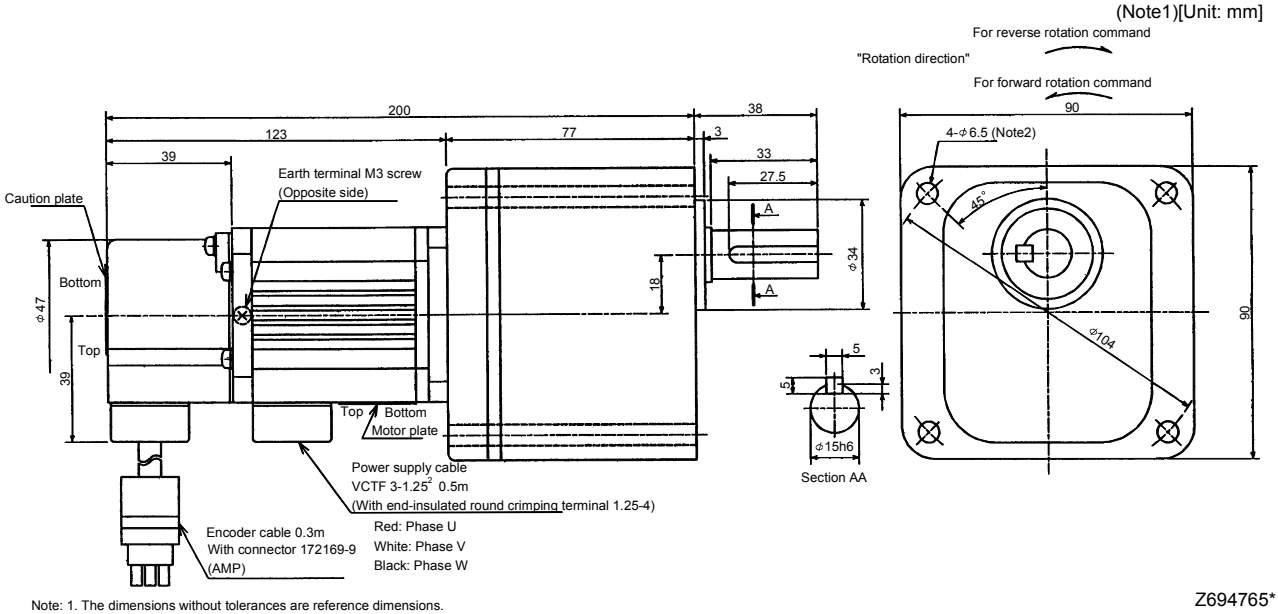


Z694764*

Note: 1. The dimensions without tolerances are reference dimensions.
2. Four M6×90 through bolts are provided.

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF13G1	100	GR-S-10	1/5(9/44)	0.10	40min. to 1.5°	2.7	Same as that of motor shaft
			1/10(3/29)				
			1/20(99/1972)	0.095			Opposite to that of motor shaft
			1/30(144/4205)				

(Note1)[Unit: mm]



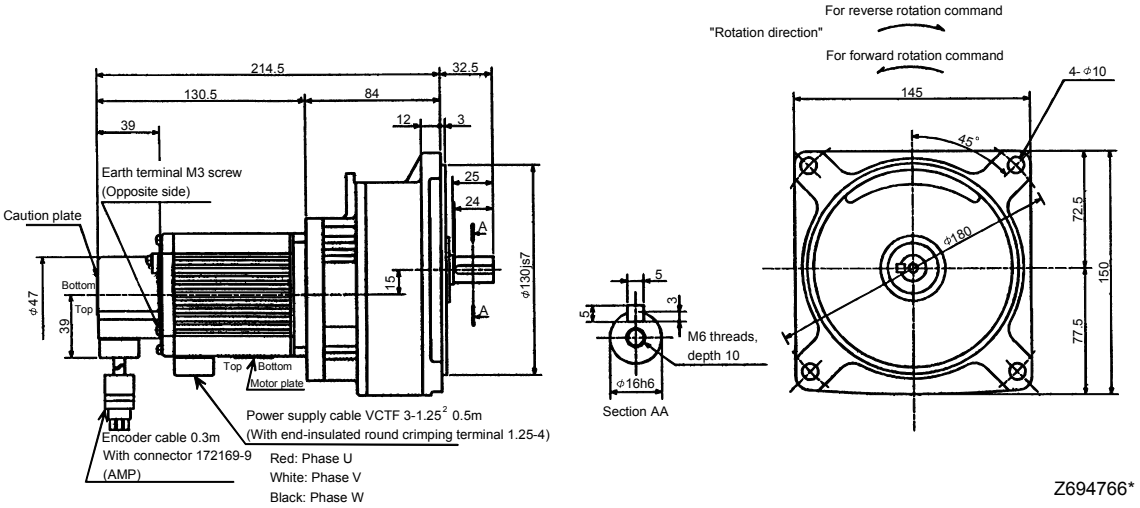
Z694765*

Note: 1. The dimensions without tolerances are reference dimensions.
2. Four M6×90 through bolts are provided.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF23G1	200	GR-S-20	1/5(57/280)	0.373	40min. to 1.5°	5.0	Same as that of motor shaft
			1/10(39/400)				
			1/20(51/980)	0.37			
			1/30(1/30)				

(Note)[Unit: mm]

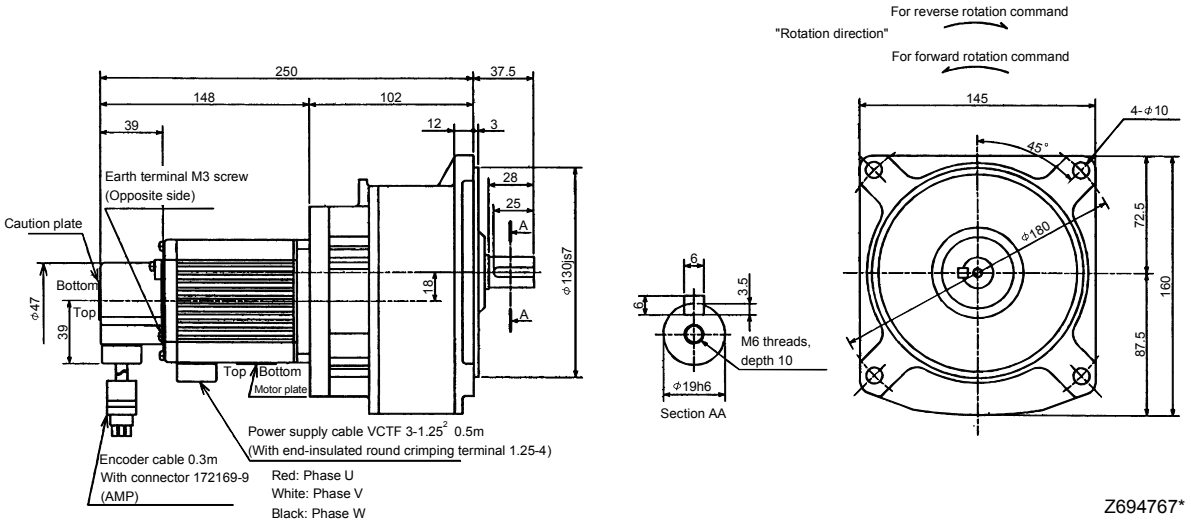


Z694766*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF33G1	300	GR-S-30	1/5(19/94)	0.545	40min. to 1.5°	6.5	Same as that of motor shaft
			1/10(39/376)				
			1/20(72/1363)	0.538			
			1/30(11/329)				

(Note)[Unit: mm]



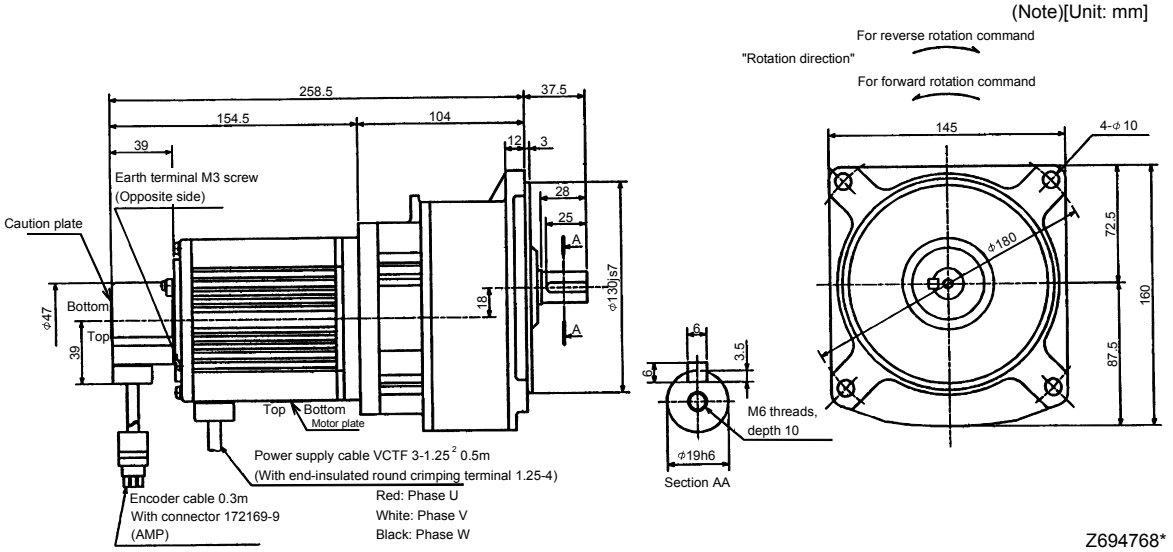
Z694767*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF43G1	400	GR-S-40	1/5(19/94)	1.02	40min. to 1.5°	8.0	Same as that of motor shaft
			1/10(39/376)				
			1/20(72/1363)	1.01			
			1/30(11/329)				

(Note)[Unit: mm]

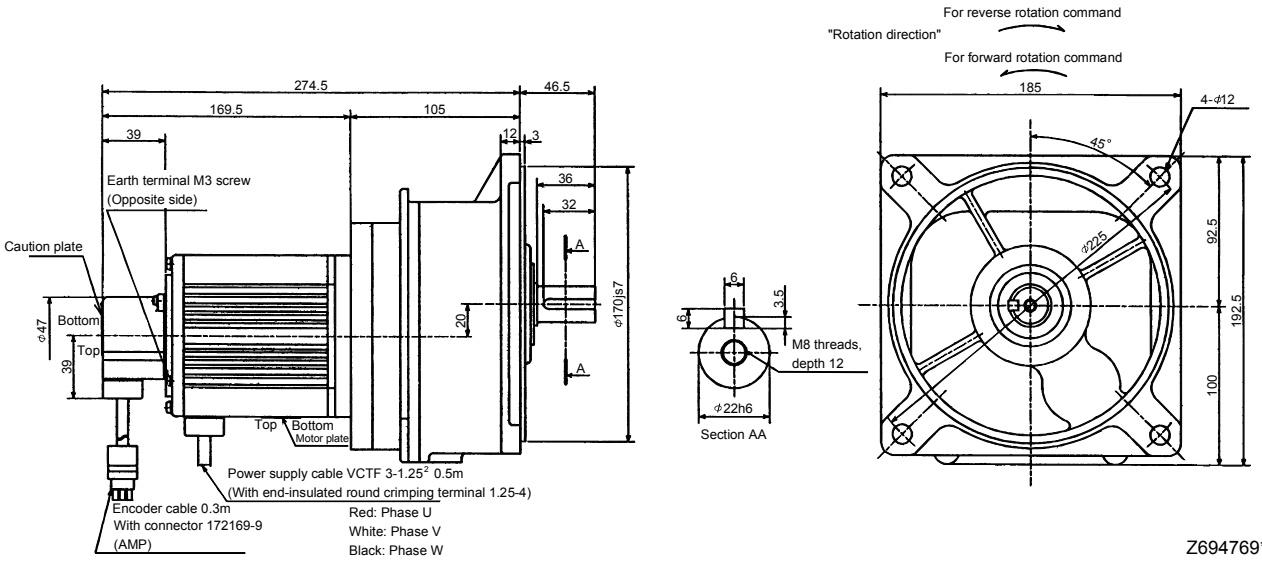


Z694768*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF63G1	600	GR-S-60	1/5(10/49)	1.34	40min. to 1.5°	13.0	Same as that of motor shaft
			1/10(243/2401)				
			1/20(153/2891)	1.32			
			1/30(27/784)				

(Note)[Unit: mm]



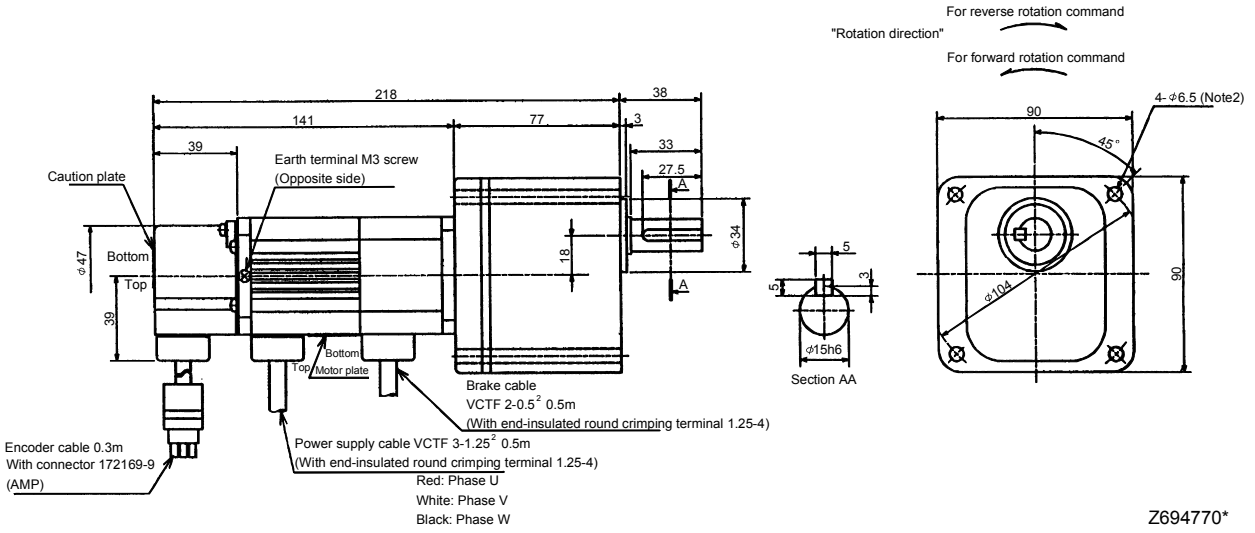
Z694769*

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF053BG1	50	0.39	GR-S-10	1/5(9/44)	0.085	40min. to 1.5°	2.8	Same as that of motor shaft
				1/10(3/29)				
				1/20(99/1972)	0.080			Opposite to that of motor shaft
				1/30(144/4205)				

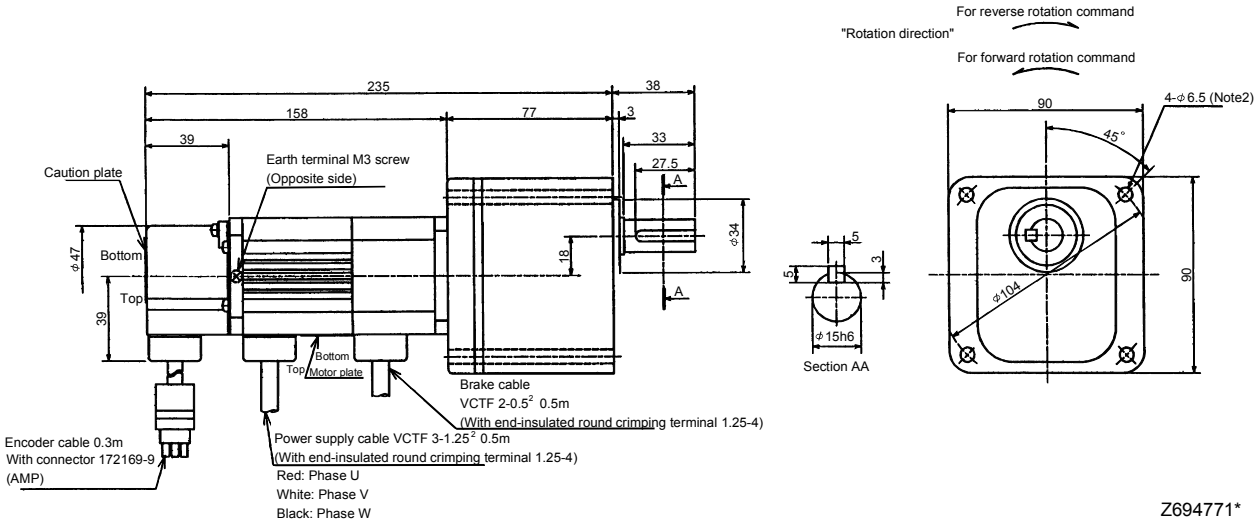
(Note1)[Unit: mm]



Note: 1. The dimensions without tolerances are reference dimensions.
2. Four M6×90 through bolts are provided.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF13BG1	100	0.39	GR-S-10	1/5(9/44)	0.115	40min. to 1.5°	3.0	Same as that of motor shaft
				1/10(3/29)				
				1/20(99/1972)	0.11			Opposite to that of motor shaft
				1/30(144/4205)				

(Note1)[Unit: mm]

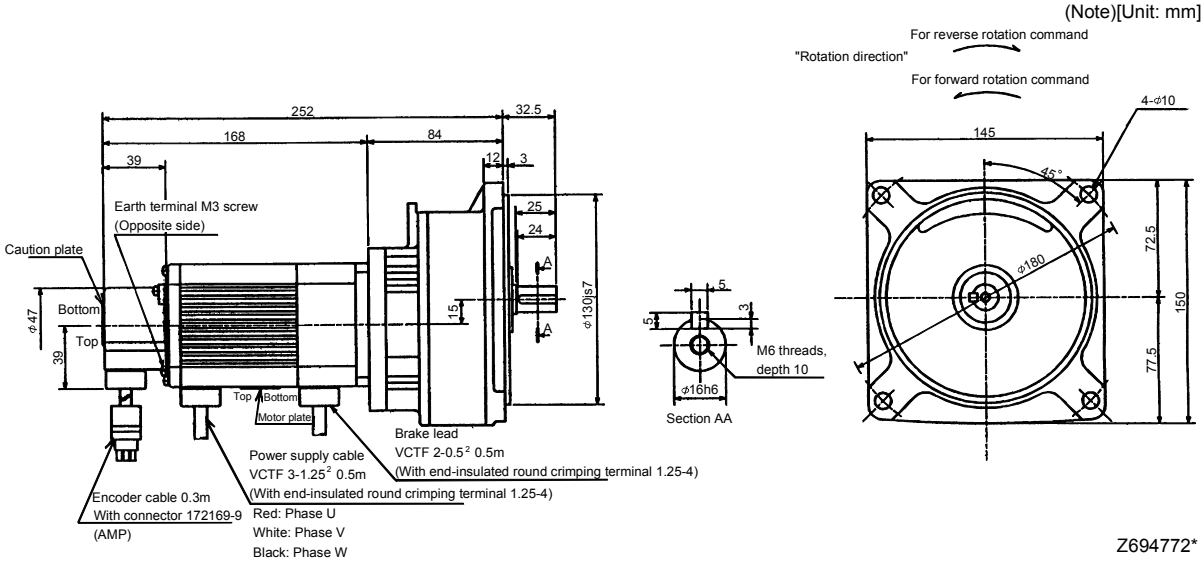


Note: 1. The dimensions without tolerances are reference dimensions.
2. Four M6×90 through bolts are provided.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF23BG1	200	1.20	GR-S-20	1/5(57/280)	0.503	40min. to 1.5°	5.6	Same as that of motor shaft
				1/10(39/400)				
				1/20(51/980)	0.500			
				1/30(1/30)				

(Note)[Unit: mm]

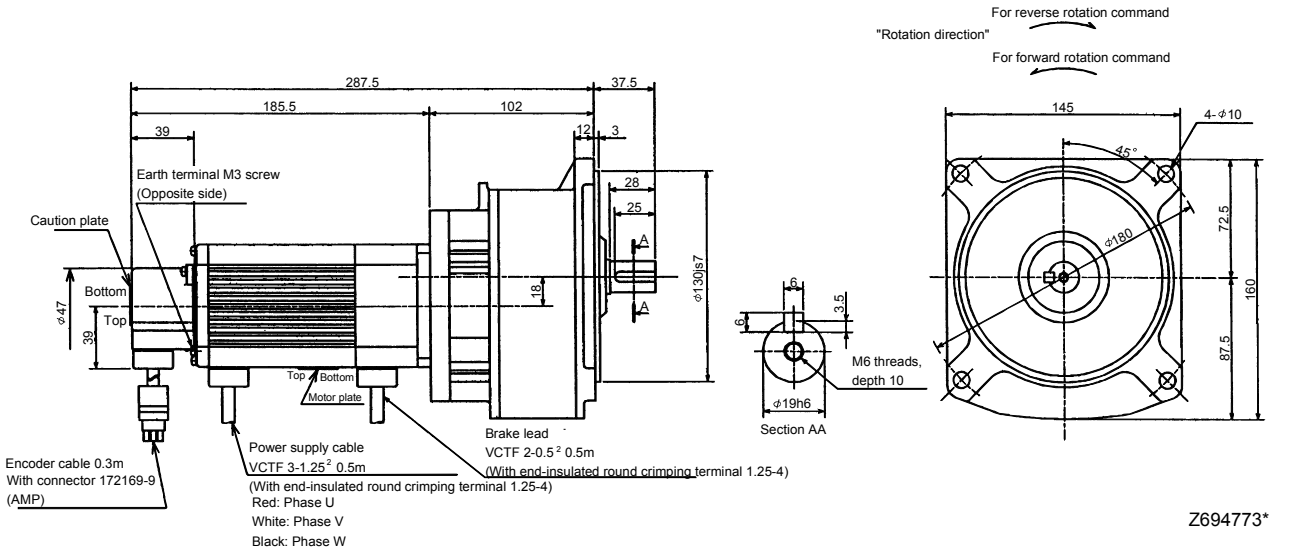


Z694772*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF33BG1	300	1.20	GR-S-30	1/5(19/94)	0.678	40min. to 1.5°	7.2	Same as that of motor shaft
				1/10(39/376)				
				1/20(72/1363)	0.670			
				1/30(11/329)				

(Note)[Unit: mm]



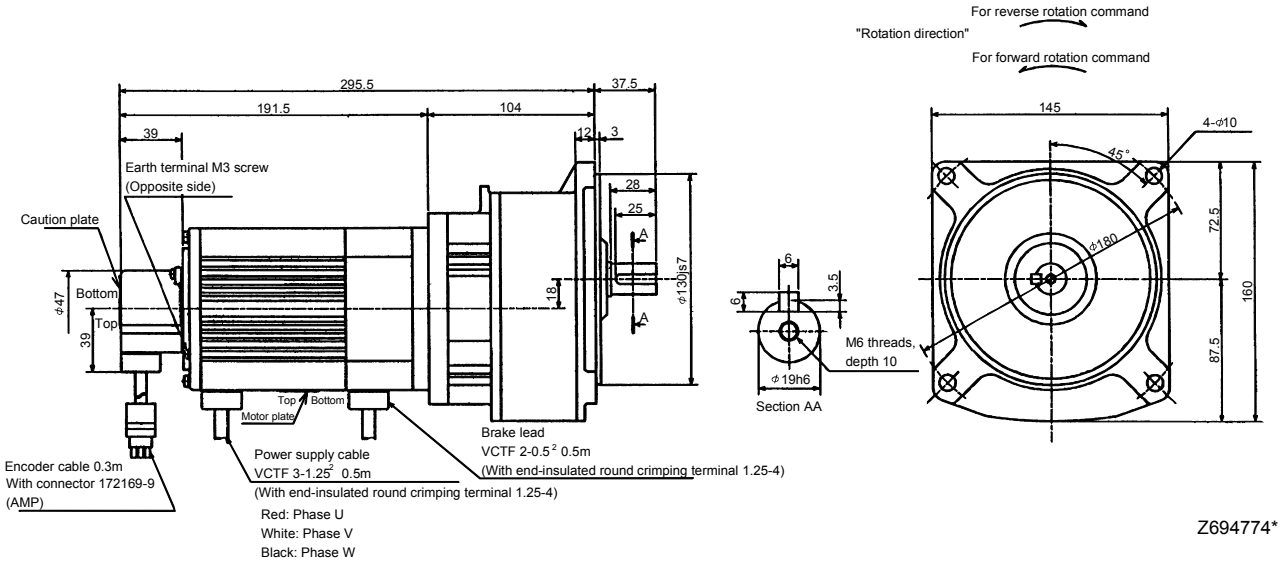
Z694773*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF43BG1	400	2.30	GR-S-40	1/5(19/94)	1.37	40min. to 1.5°	8.9	Same as that of motor shaft
				1/10(39/376)				
				1/20(72/1363)	1.36			
				1/30(11/329)				

(Note)[Unit: mm]

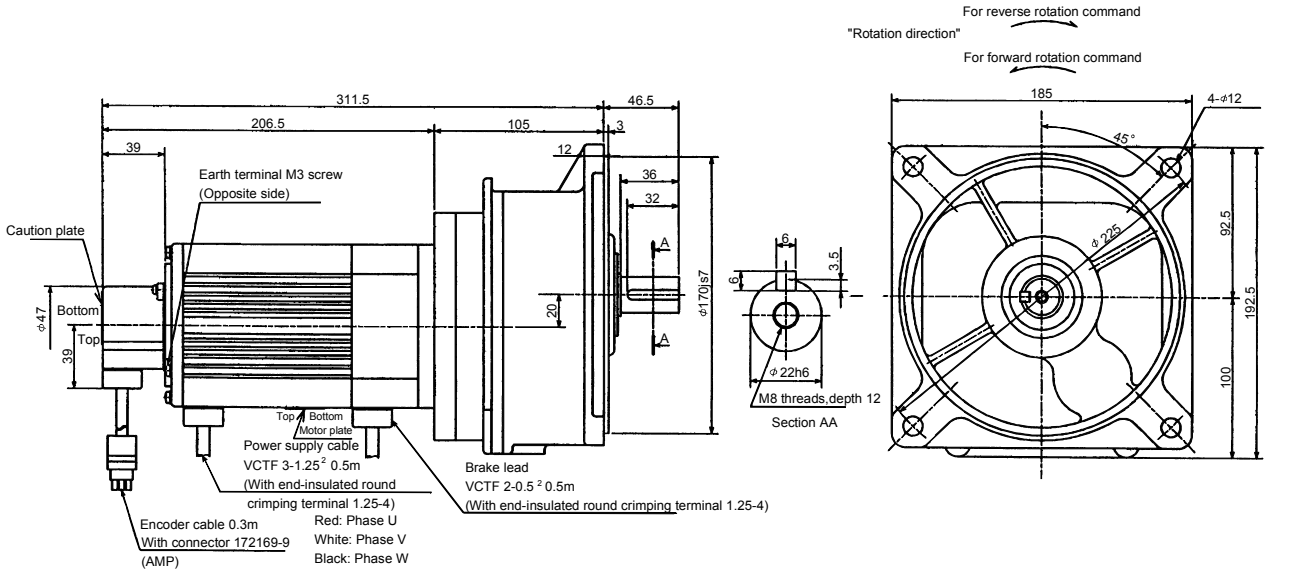


Z694774*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]	Output Shaft Rotation Direction
HA-FF63BG1	600	2.30	GR-S-60	1/5(10/49)	1.69	40min. to 1.5°	13.9	Same as that of motor shaft
				1/10(243/2401)				
				1/20(153/2891)	1.67			
				1/30(27/784)				

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Z694775*

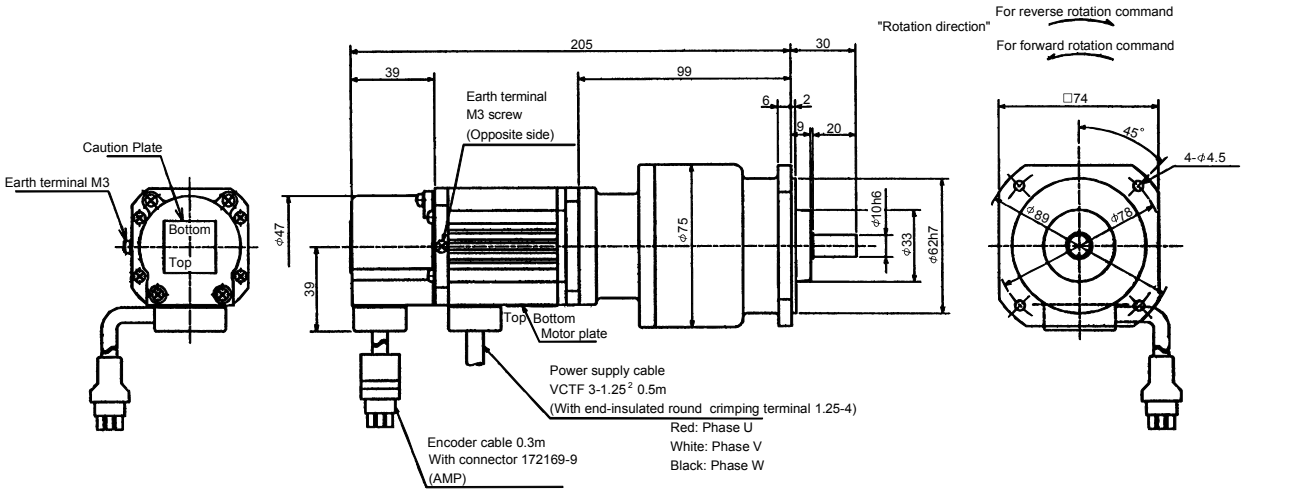
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053G2	50	BM2-05B-A5MES	1/5	0.11	3 min. max.	2.3

(Note)[Unit: mm]

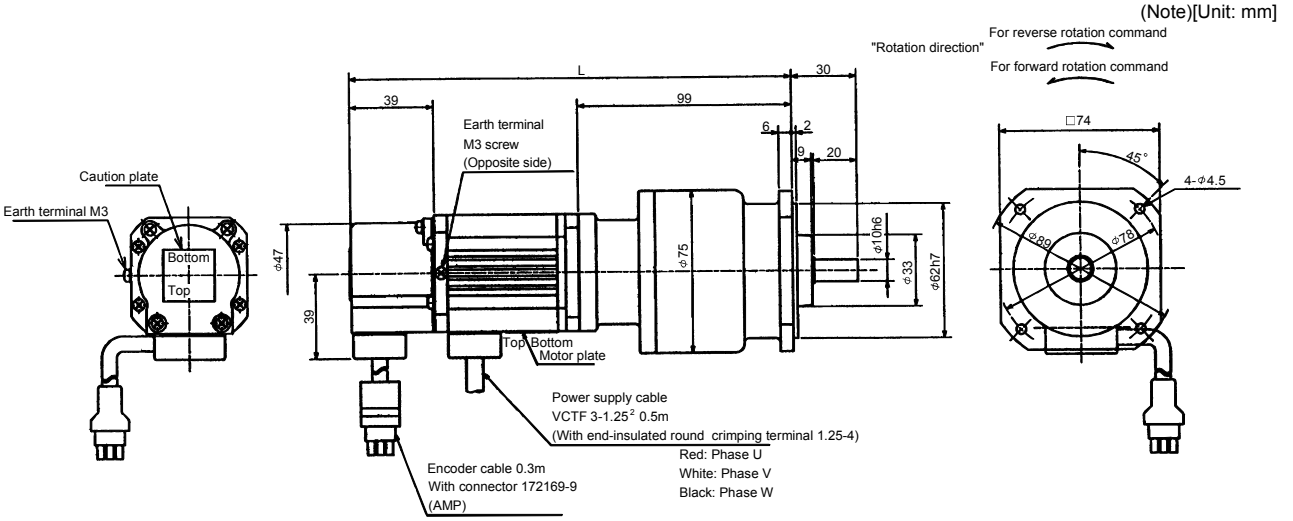


Note: The dimensions without tolerances are reference dimensions.

Z694850*

Model	Output [W]	Variable dimensions L	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053G2	50	205	BM2-10B-A5MES	1/10	0.108	3 min. max.	2.3
HA-FF053G2	50	205	BM2-15B-A5MES	1/15	0.105	3 min. max.	2.3
HA-FF13G2	100	205	BM2-05B-01MES	1/5	0.143	3 min. max.	2.5

(Note)[Unit: mm]



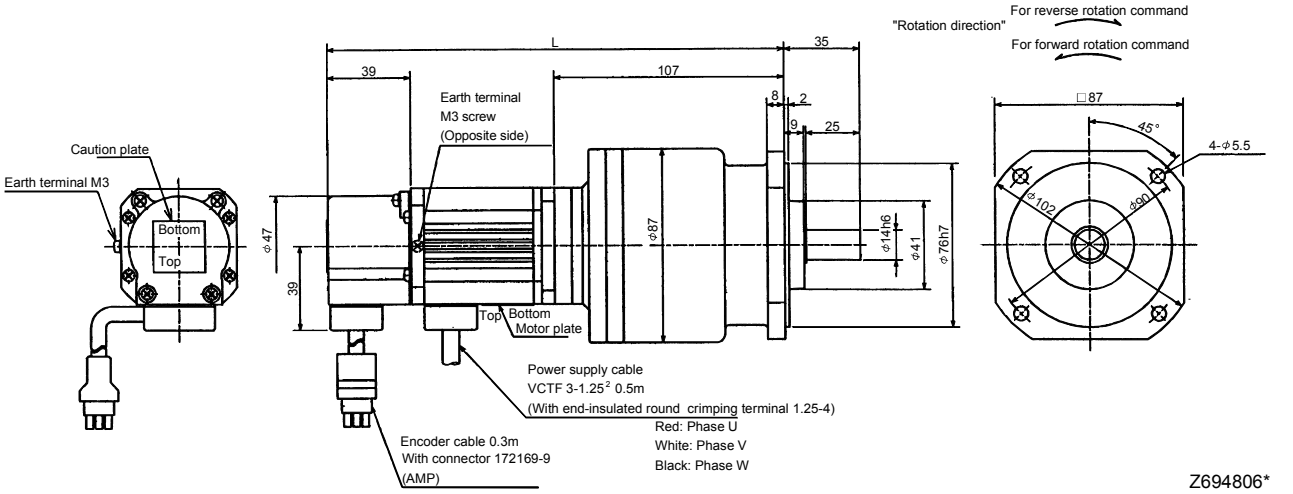
Z694805*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053G2	50	213	BM3-25B-A5MES	1/25	0.110	3min. max.	2.8
HA-FF13G2	100	230	BM3-10B-01MES	1/10	0.165	3min. max.	3.0
HA-FF13G2	100	230	BM3-15B-01MES	1/15	0.155	3min. max.	3.0

(Note)[Unit: mm]

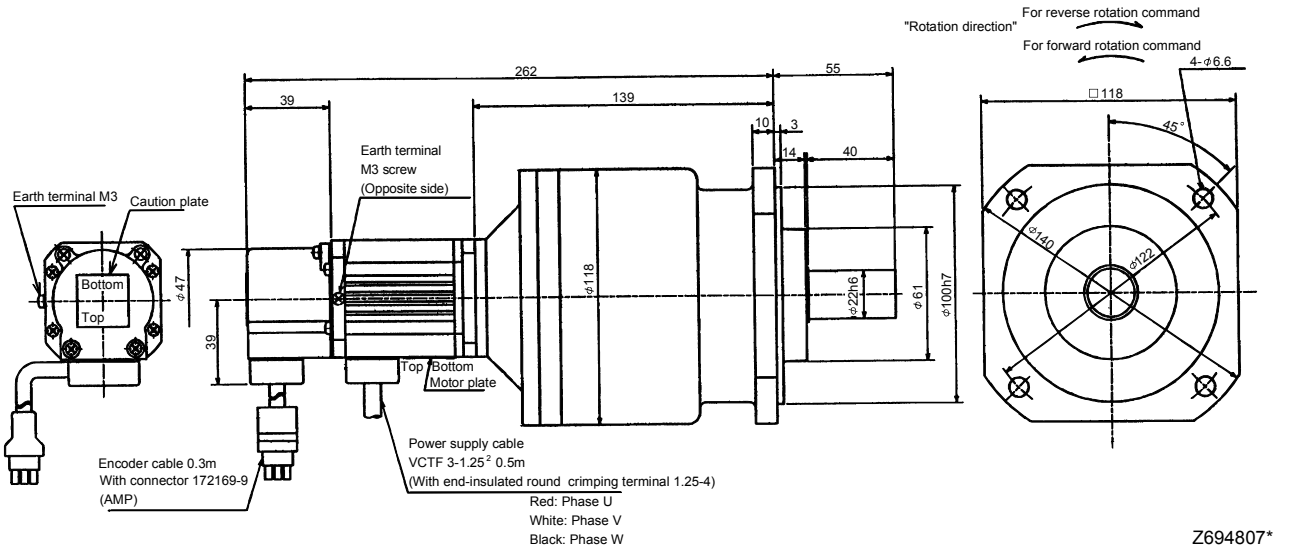


Z694806*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF13G2	100	BM4-25B-01MES	1/25	0.29	3min. max.	5.0

(Note)[Unit: mm]



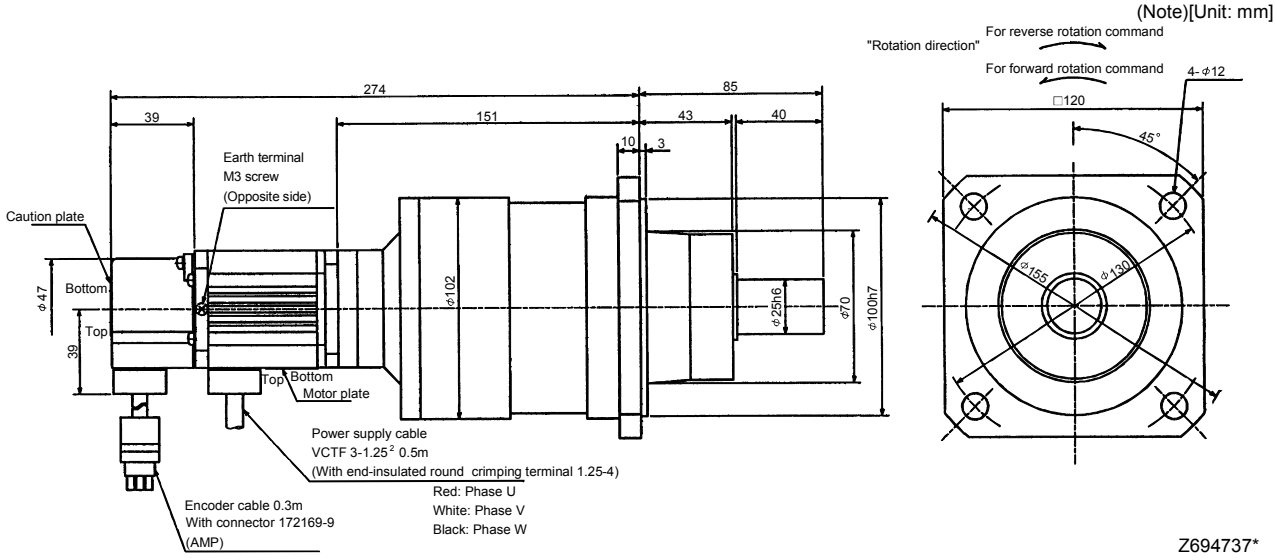
Z694807*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF13G2	100	BL1-45B-01MES	1/45	0.293	3min. max.	6.0

(Note)[Unit: mm]

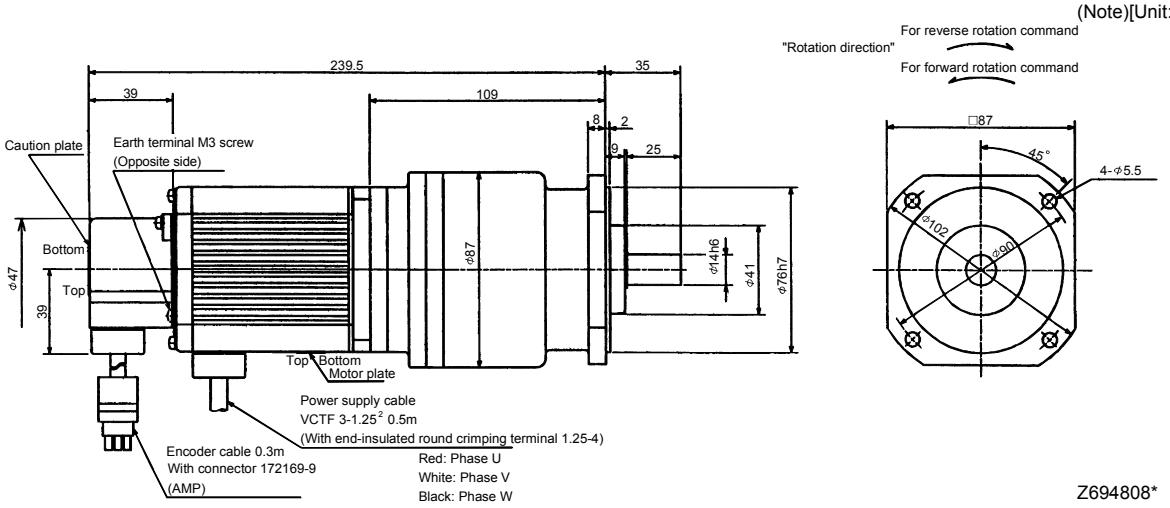


Z694737*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23G2	200	BM3-05B-02MES	1/5	0.425	3min. max.	3.8

(Note)[Unit: mm]



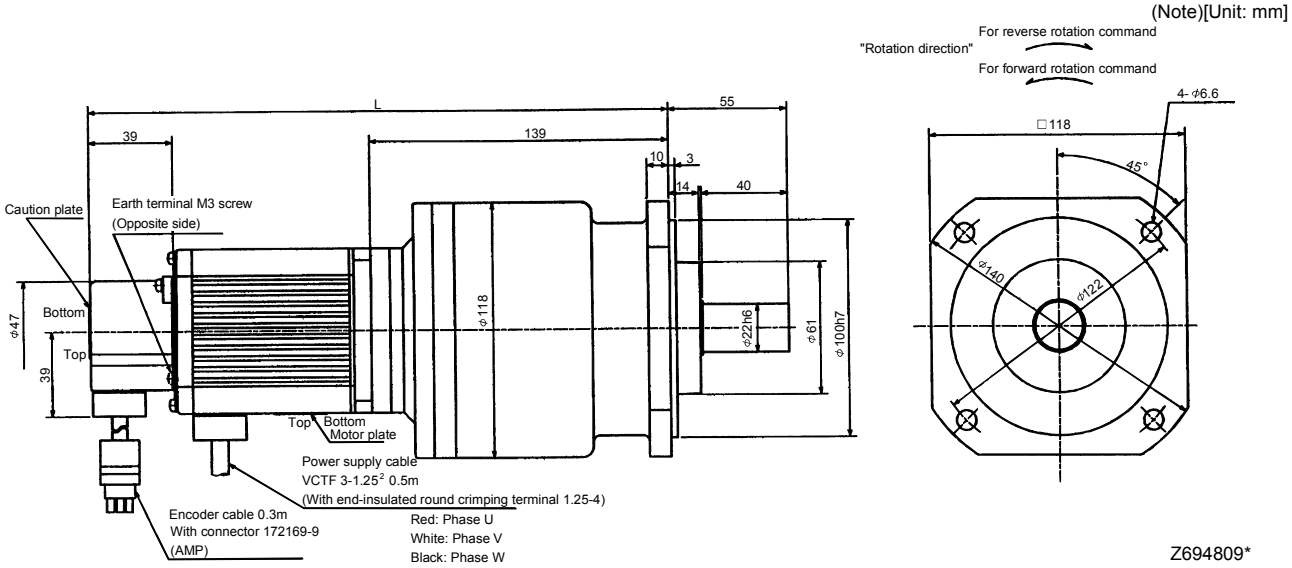
Z694808*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23G2	200	269.5	BM4-10B-02MES	1/10	0.645	3min. max.	5.8
HA-FF23G2	200	269.5	BM4-15B-02MES	1/15	0.618	3min. max.	5.8
HA-FF33G2	300	287	BM4-10B-03MES	1/10	0.795	3min. max.	6.1

(Note)[Unit: mm]

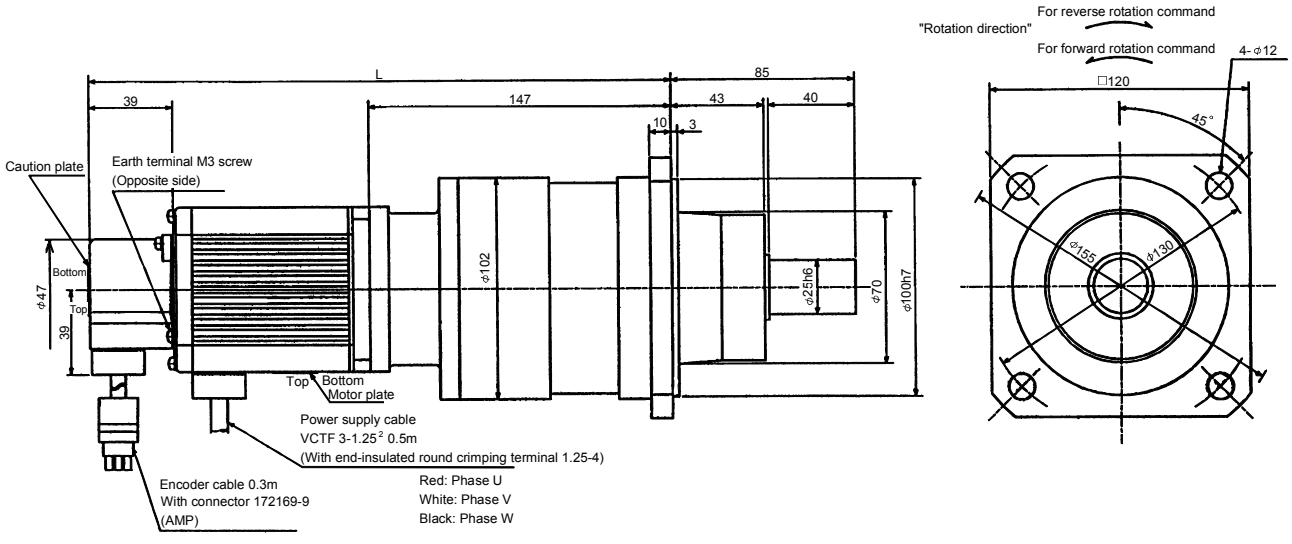


Z694809*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable dimensions L	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23G2	200	278	BL1-20B-02MES	1/20	0.730	3min. max.	6.8
HA-FF23G2	200	278	BL1-29B-02MES	1/29	0.633	3min. max.	6.8
HA-FF33G2	300	295	BL1-20B-03MES	1/20	0.880	3min. max.	7.1

(Note)[Unit: mm]



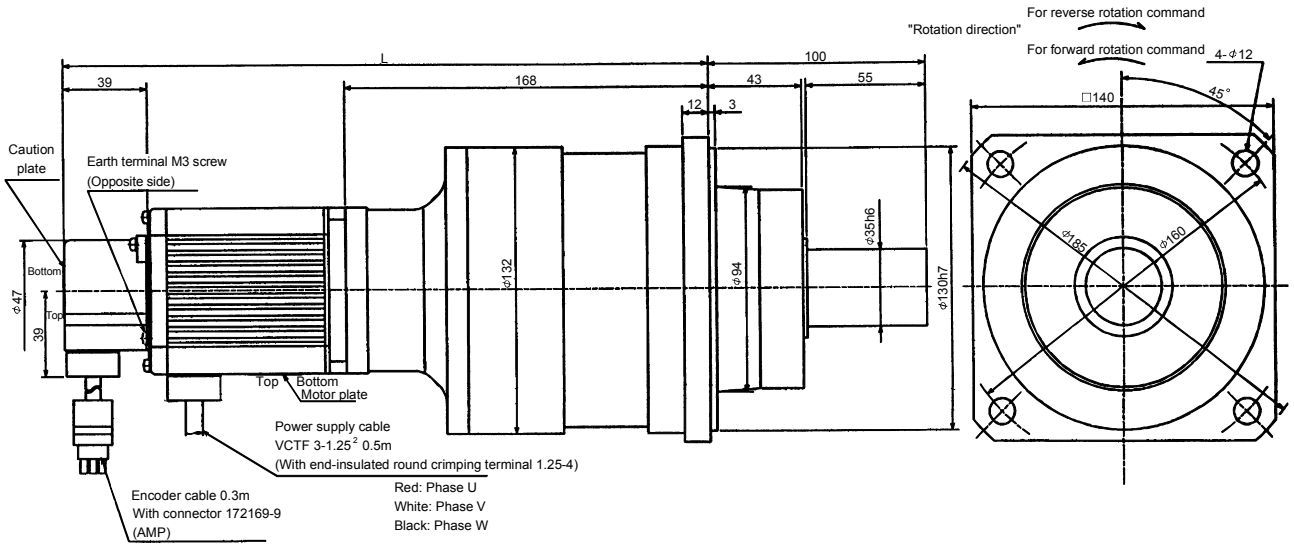
Z694738*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23G2	200	299	BL2-45B-02MES	1/45	0.763	3min. max.	12.3
HA-FF33G2	300	316	BL2-29B-03MES	1/29	1.535	3min. max.	12.6
HA-FF33G2	300	316	BL2-45B-03MES	1/45	0.913	3min. max.	12.6

(Note)[Unit: mm]

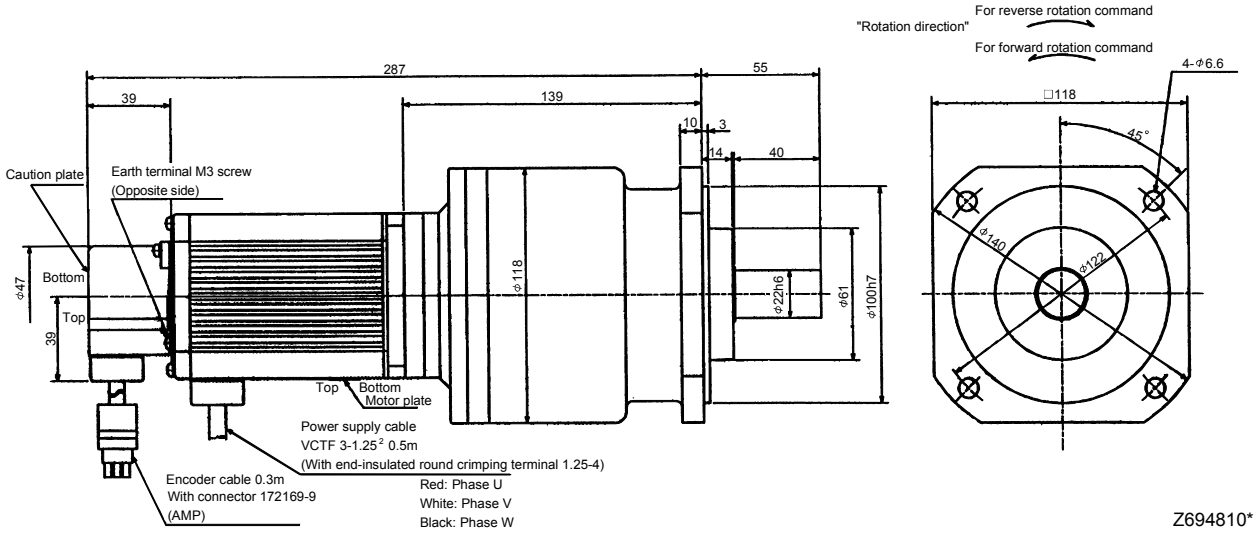


Note: The dimensions without tolerances are reference dimensions.

Z694739*

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF33G2	300	BM4-05B-03MES	1/5	0.818	3min. max.	6.1

(Note)[Unit: mm]



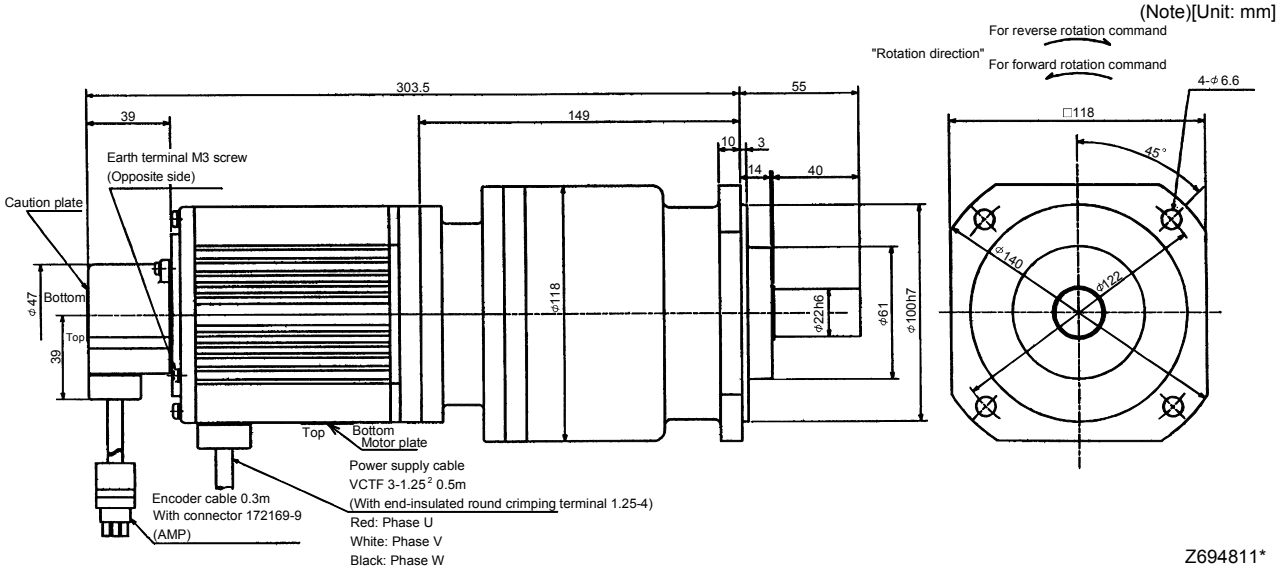
Z694810*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF43G2	400	BM4-05B-04MES	1/5	1.293	3min. max.	7.7

(Note)[Unit: mm]

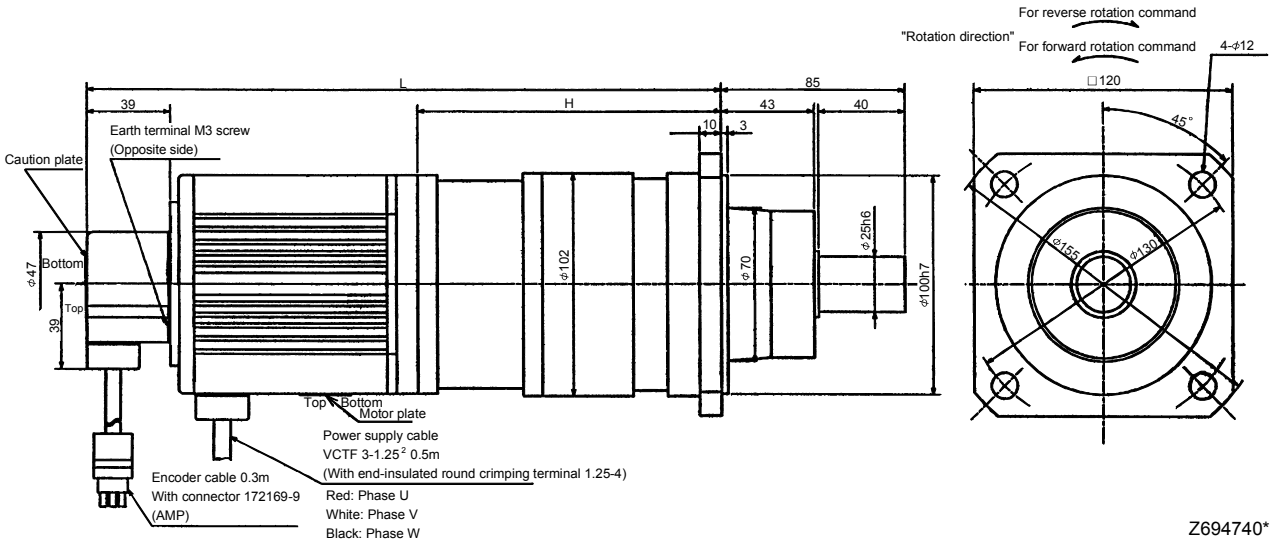


Z694811*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions H	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF43G2	400	295.5	141	BL1-09B-04MES	1/9	1.193	3min. max.	8.2
HA-FF63G2	600	300.5	131	BL1-05B-06MES	1/5	1.283	3min. max	8.8
HA-FF63G2	600	310.5	141	BL1-09B-06MES	1/9	1.418	3min. max	8.8

(Note)[Unit: mm]



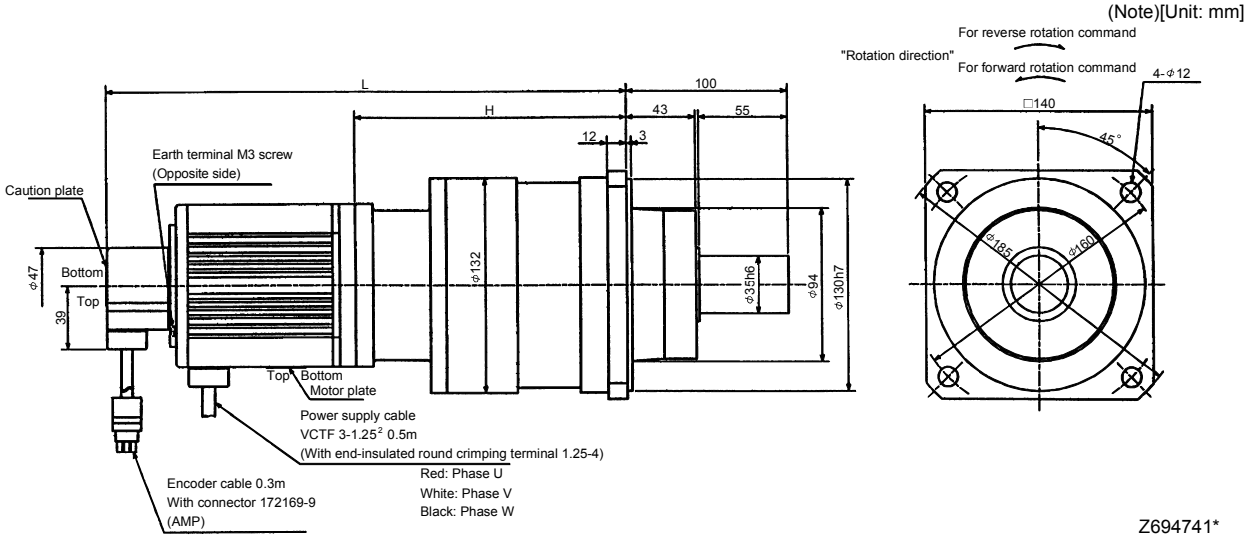
Z694740*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions L	Variable Dimensions H	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF43G2	400	323.5	169	BL2-20B-04MES	1/20	2.378	3min. max	14.2
HA-FF43G2	400	323.5	169	BL2-29B-04MES	1/29	2.010	3min. max	14.2
HA-FF43G2	400	333.5	179	BL2-45B-04MES	1/45	1.388	3min. max	14.2
HA-FF63G2	600	338.5	169	BL2-20B-06MES	1/20	2.603	3min. max	14.8
HA-FF63G2	600	338.5	169	BL2-29B-06MES	1/29	2.235	3min. max	14.8

(Note)[Unit: mm]

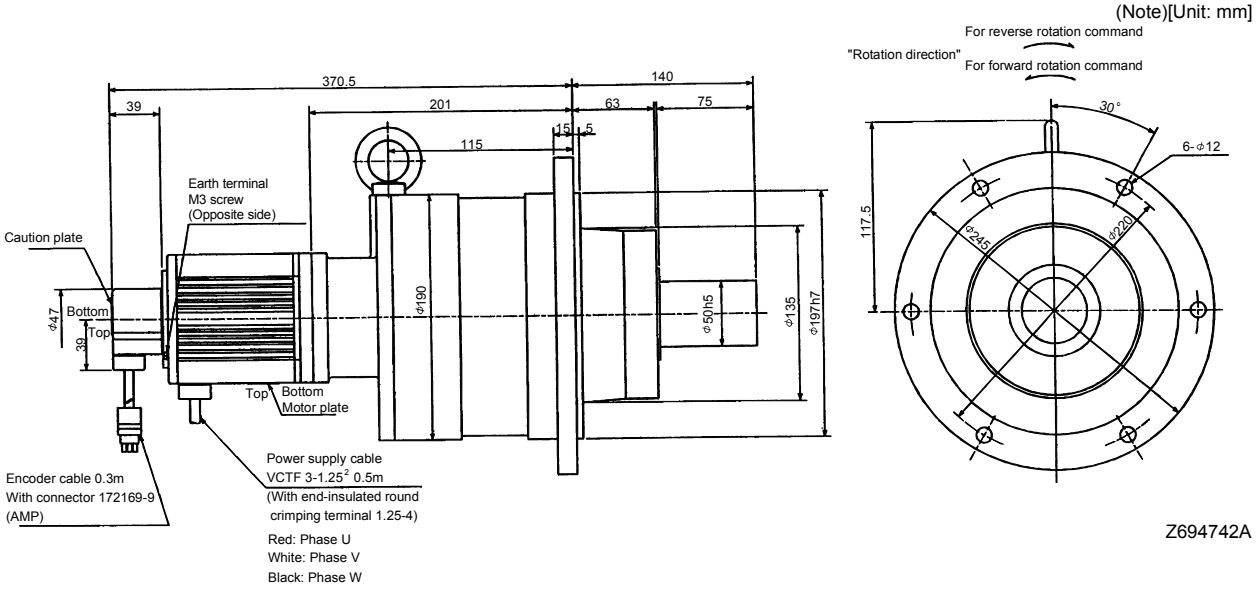


Z694741*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF63G2	600	BL3-45B-06MES	1/45	3.13	3min. max.	29.8

(Note)[Unit: mm]



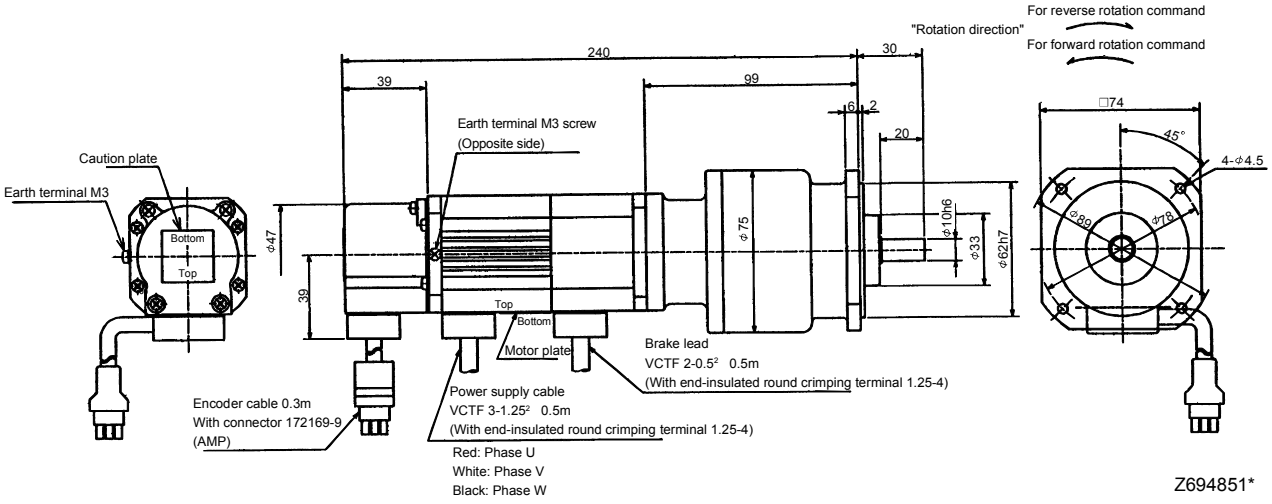
Z694742A

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053BG2	50	0.39	BM2-05B-A5MES	1/5	0.128	3min. max.	2.6

(Note)[Unit: mm]

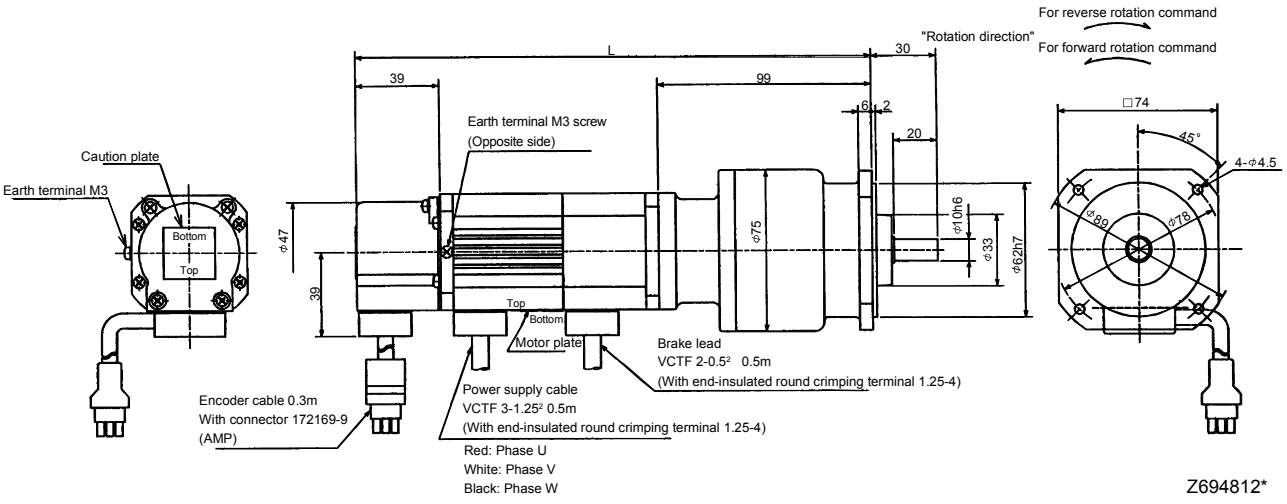


Z694851*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable dimensions L	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053BG2	50	240	0.39	BM2-05B-A5MES	1/10	0.125	3 min. max.	2.6
HA-FF053BG2	50	240	0.39	BM2-15B-A5MES	1/15	0.123	3 min. max.	2.6
HA-FF13BG2	100	257	0.39	BM2-05B-01MES	1/5	0.160	3 min. max.	2.8

(Note)[Unit: mm]



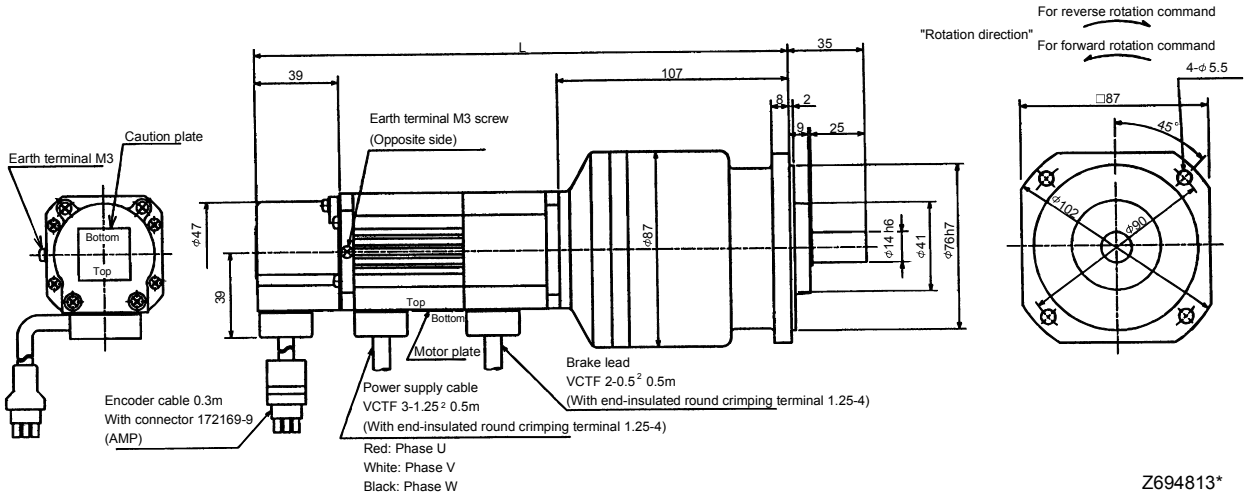
Z694812*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF053BG2	50	248	0.39	BM3-25B-A5MES	1/25	0.120	3 min. max.	3.2
HA-FF13BG2	100	265	0.39	BM3-10B-01MES	1/10	0.183	3 min. max.	3.4
HA-FF13BG2	100	265	0.39	BM3-15B-01MES	1/15	0.173	3 min. max.	3.4

(Note)[Unit: mm]

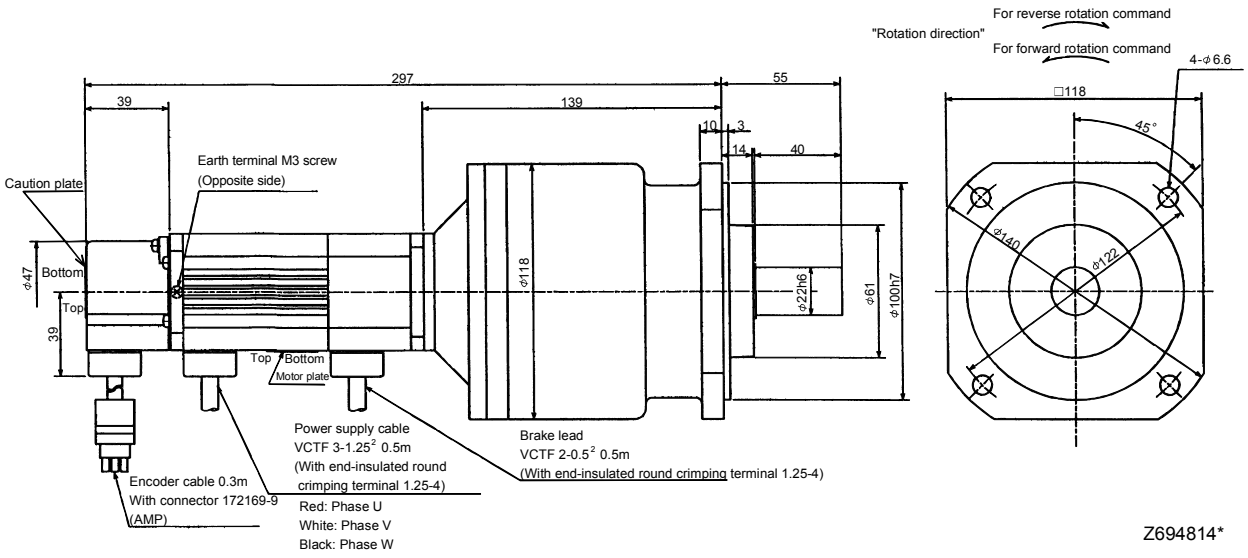


Z694813*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF13BG2	100	0.39	BM4-25B-01MES	1/25	0.308	3 min. max.	5.3

(Note)[Unit: mm]



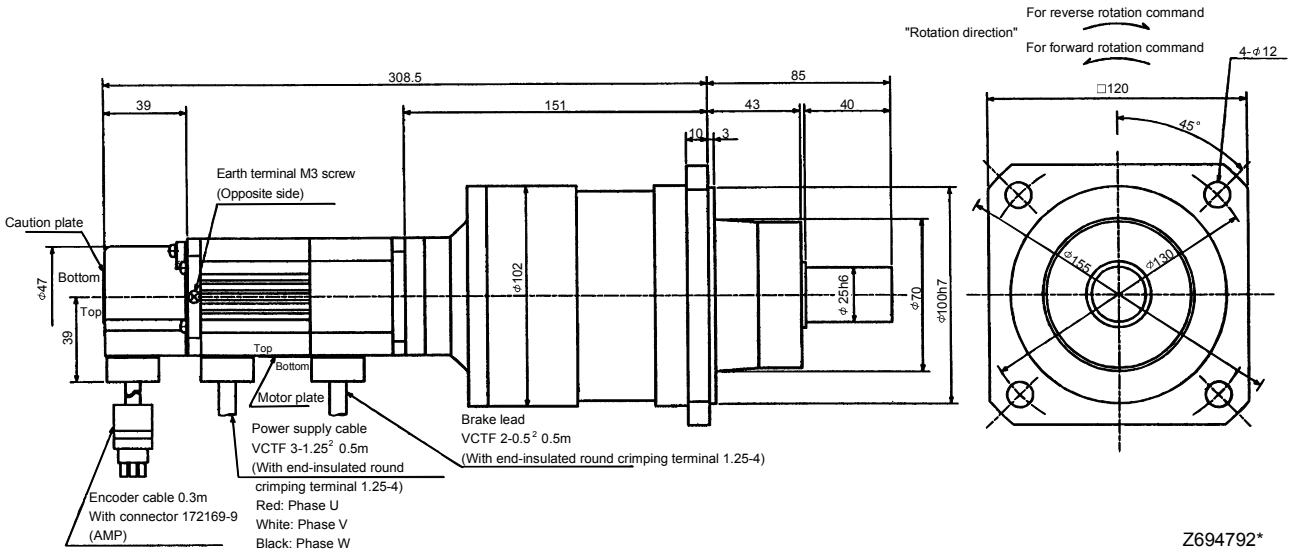
Z694814*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF13BG2	100	0.39	BL1-45B-01MES	1/45	0.298	3 min. max.	6.3

(Note)[Unit: mm]

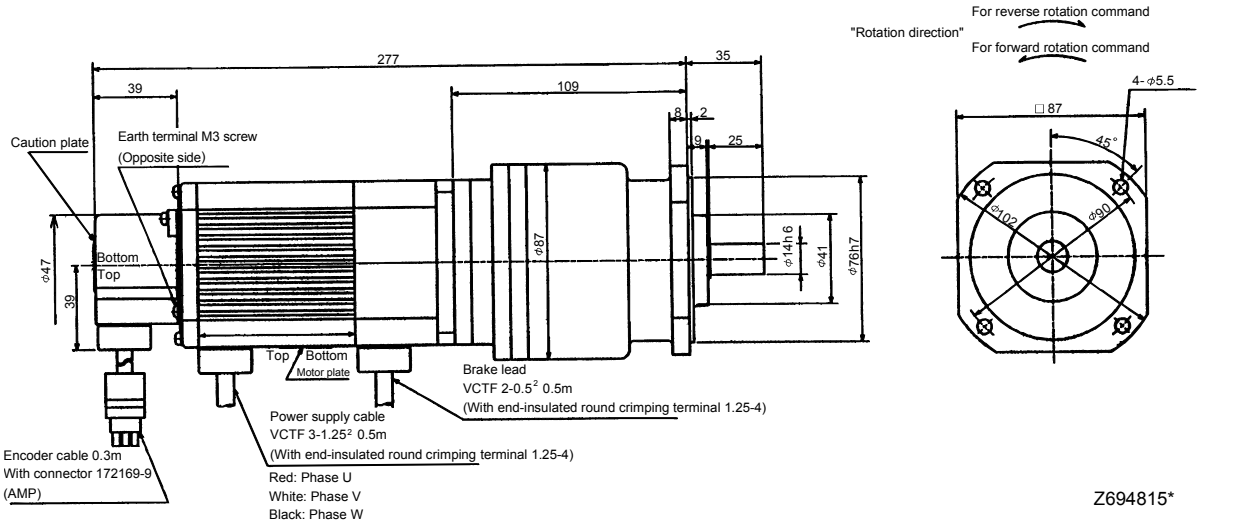


Z694792*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23BG2	200	1.2	BM3-05B-02MES	1/5	0.558	3 min. max.	4.4

(Note)[Unit: mm]



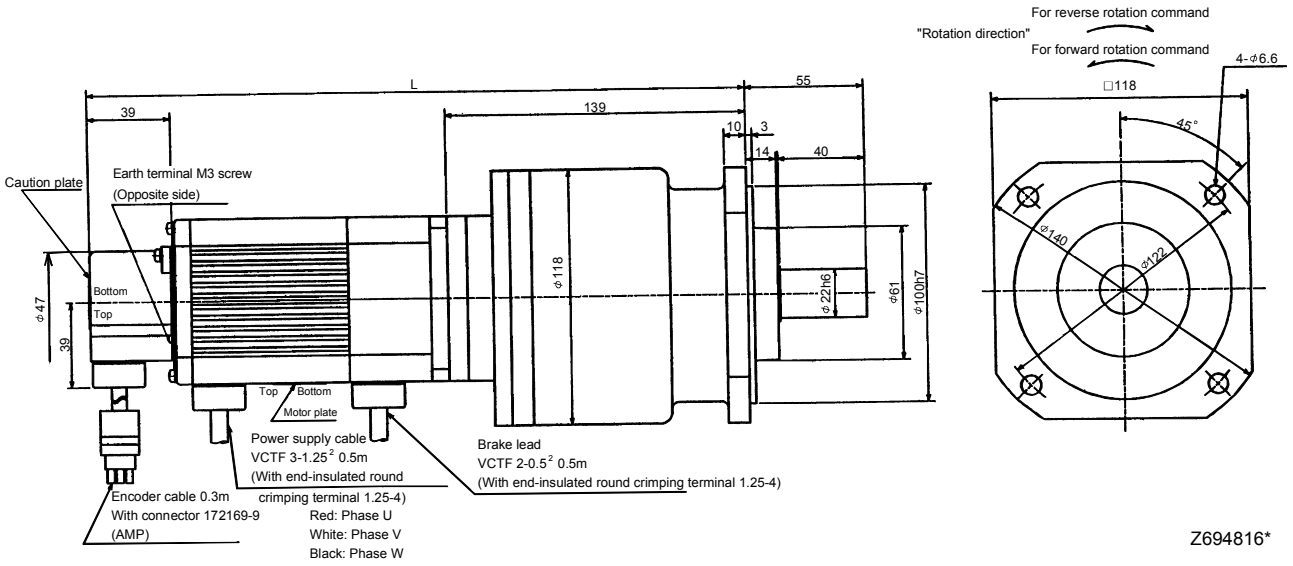
Z694815*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23BG2	200	307	1.2	BM4-10B-02MES	1/10	0.778	3 min. max.	6.4
HA-FF23BG2	200	307	1.2	BM4-15B-02MES	1/15	0.75	3 min. max.	6.4
HA-FF33BG2	300	324.5	1.2	BM4-10B-03MES	1/10	0.928	3 min. max.	6.7

(Note)[Unit: mm]

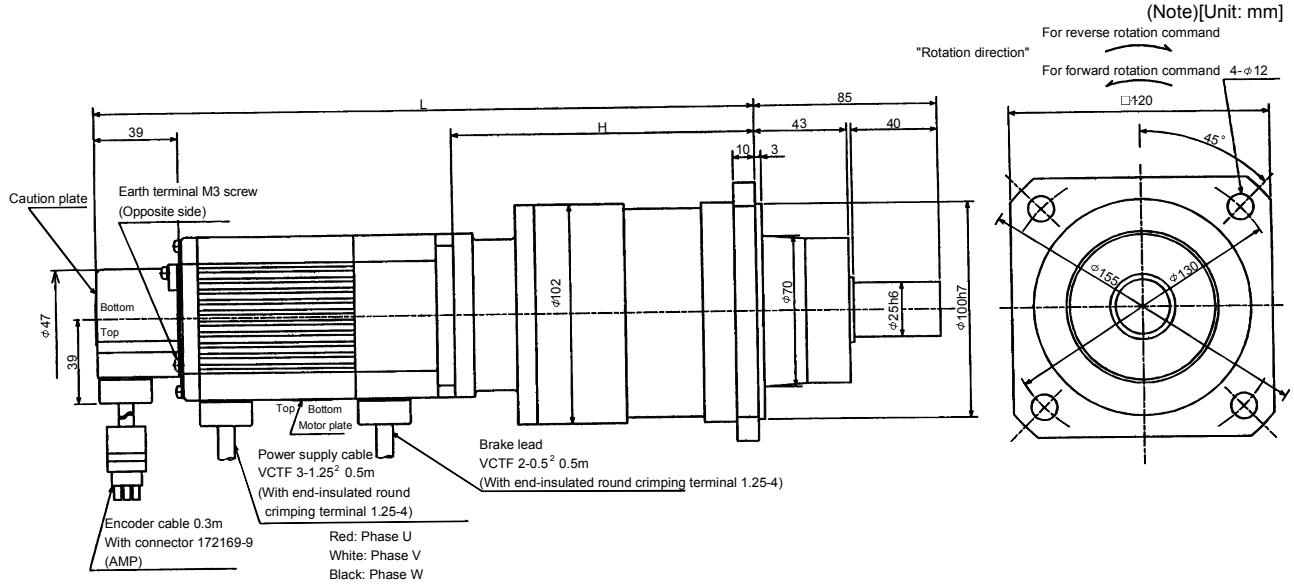


Z694816*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable dimensions L	Variable dimensions H	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23BG2	200	311.5	144	1.2	BL1-20B-02MES	1/20	0.885	3 min. max.	7.4
HA-FF23BG2	200	314.5	147	1.2	BL1-29B-02MES	1/29	0.765	3 min. max.	7.4
HA-FF33BG2	300	329.5	144	1.2	BL1-20B-03MES	1/20	1.013	3 min. max.	7.7

(Note)[Unit: mm]



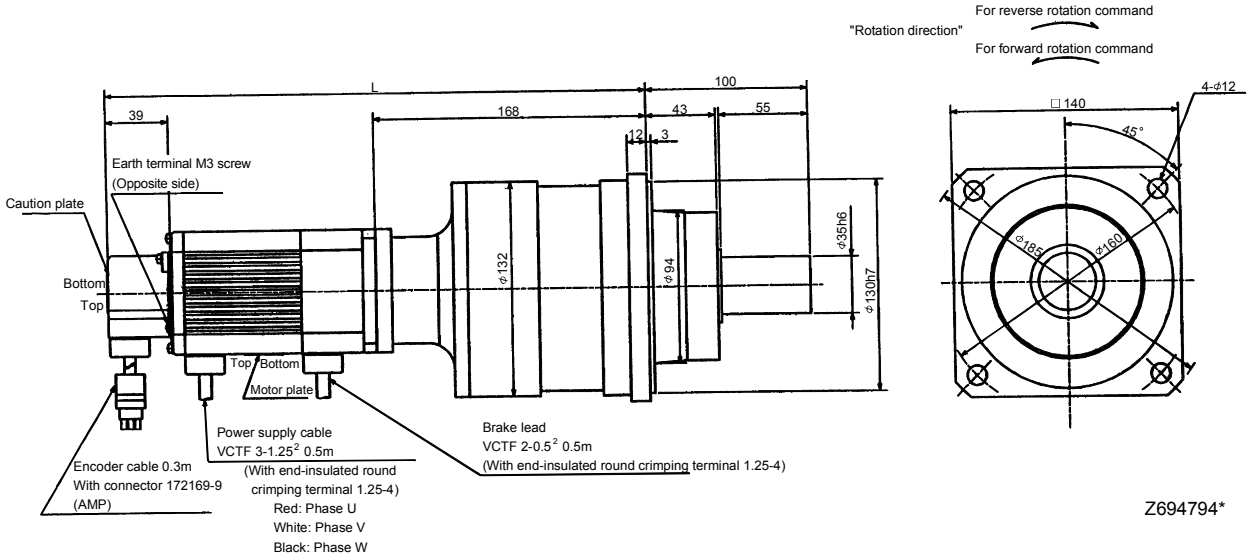
Note: The dimensions without tolerances are reference dimensions.

Z694793*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions L	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF23BG2	200	336	1.2	BL2-45B-02MES	1/45	0.895	3 min. max.	12.9
HA-FF33BG2	300	353.5	1.2	BL2-29B-03MES	1/29	1.668	3 min. max.	13.2
HA-FF33BG2	300	363.5	1.2	BL2-45B-03MES	1/45	1.045	3 min. max.	13.2

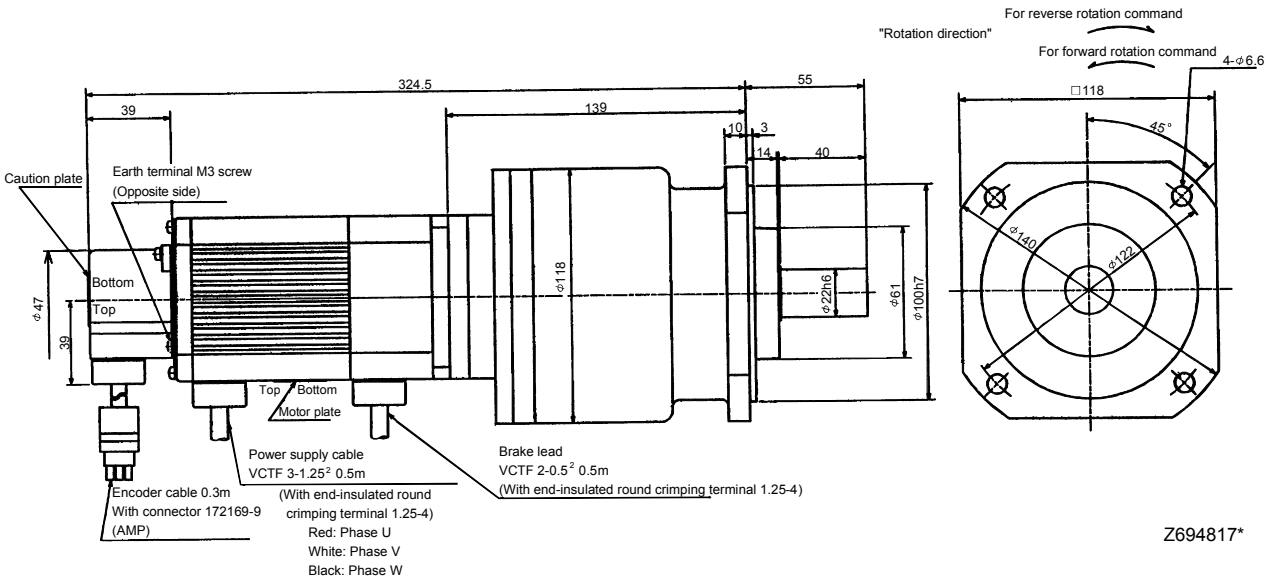
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF33BG2	300	1.2	BM4-05B-03MES	1/5	0.95	3 min. max.	6.7

(Note)[Unit: mm]

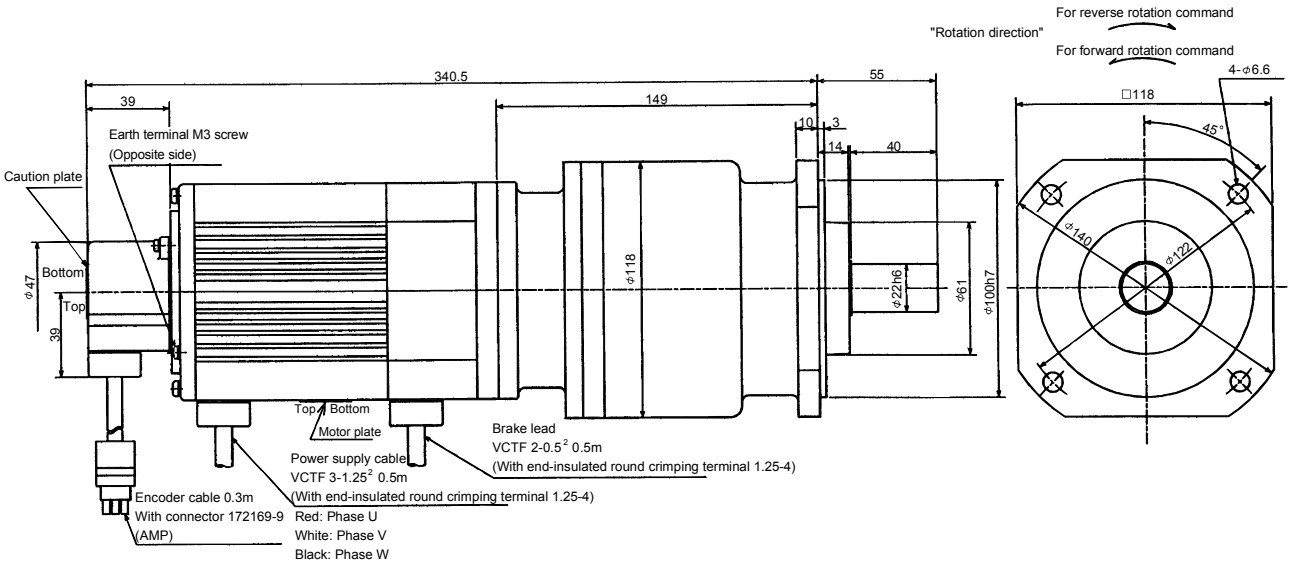


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HA-FF43BG2	400	2.3	BM4-05B-04MES	1/5	1.643	3 min. max.	8.5

(Note)[Unit: mm]

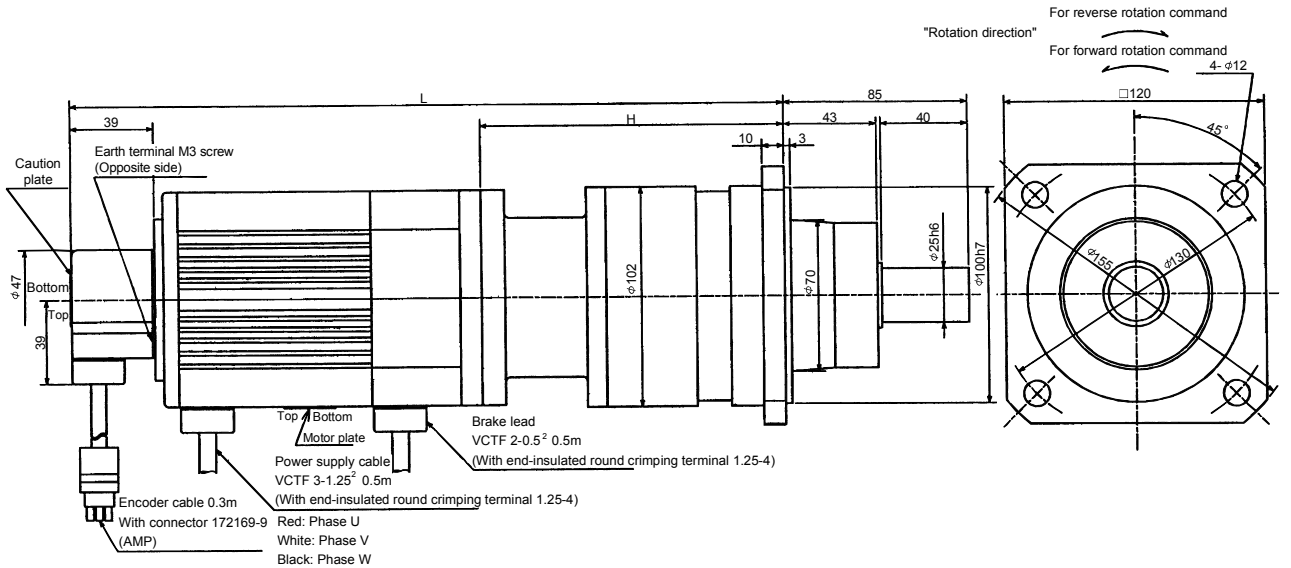


Note: The dimensions without tolerances are reference dimensions.

Z694818*

Model	Output [W]	Variable dimensions		Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
		L	H						
HA-FF43BG2	400	332.5	141	2.3	BL1-09B-04MES	1/9	1.543	3 min. max.	9.0
HA-FF63BG2	600	337.5	131	2.3	BL1-05B-06MES	1/5	1.858	3 min. max.	9.6
HA-FF63BG2	600	347.5	141	2.3	BL1-09B-06MES	1/9	1.768	3 min. max.	9.6

(Note)[Unit: mm]



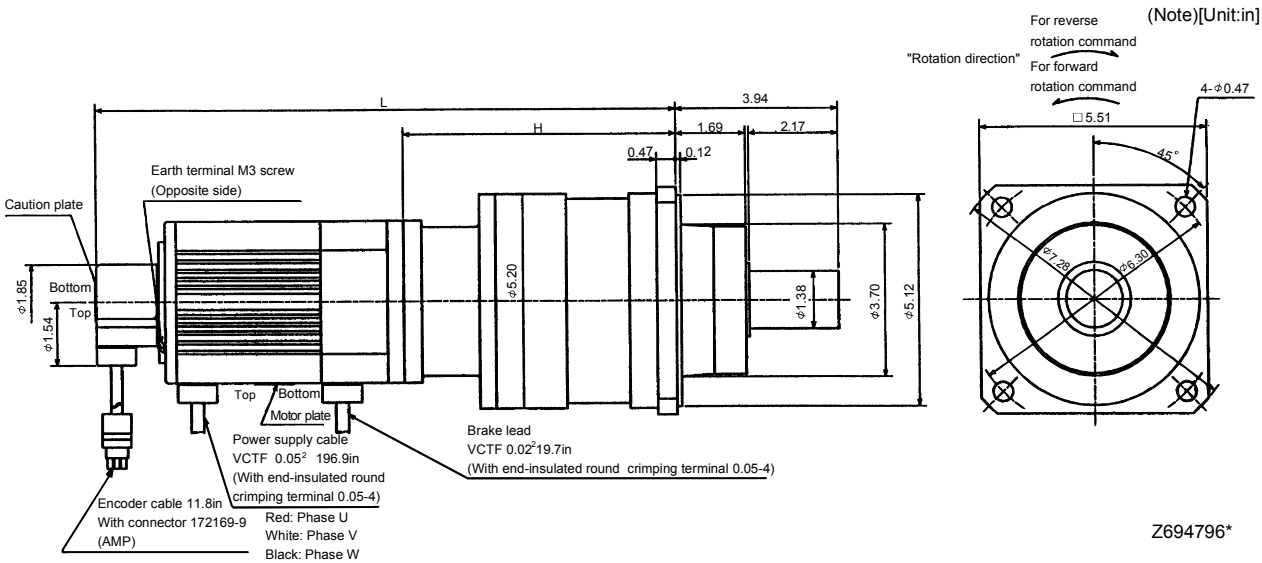
Note: The dimensions without tolerances are reference dimensions.

Z694795*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable dimensions		Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Backlash	Mass [kg]
		L	H						
HA-FF43BG2	400	360.5	169	2.3	BL2-20B-04MES	1/20	2.623	3 min. max.	15
HA-FF43BG2	400	360.5	169	2.3	BL2-29B-04MES	1/29	2.36	3 min. max.	15
HA-FF43BG2	400	370.5	179	2.3	BL2-45B-04MES	1/45	1.738	3 min. max.	15
HA-FF63BG2	600	375.5	169	2.3	BL2-20B-06MES	1/20	2.953	3 min. max.	15.6
HA-FF63BG2	600	375.5	169	2.3	BL2-29B-06MES	1/29	2.585	3 min. max.	15.6

(Note)[Unit:in]

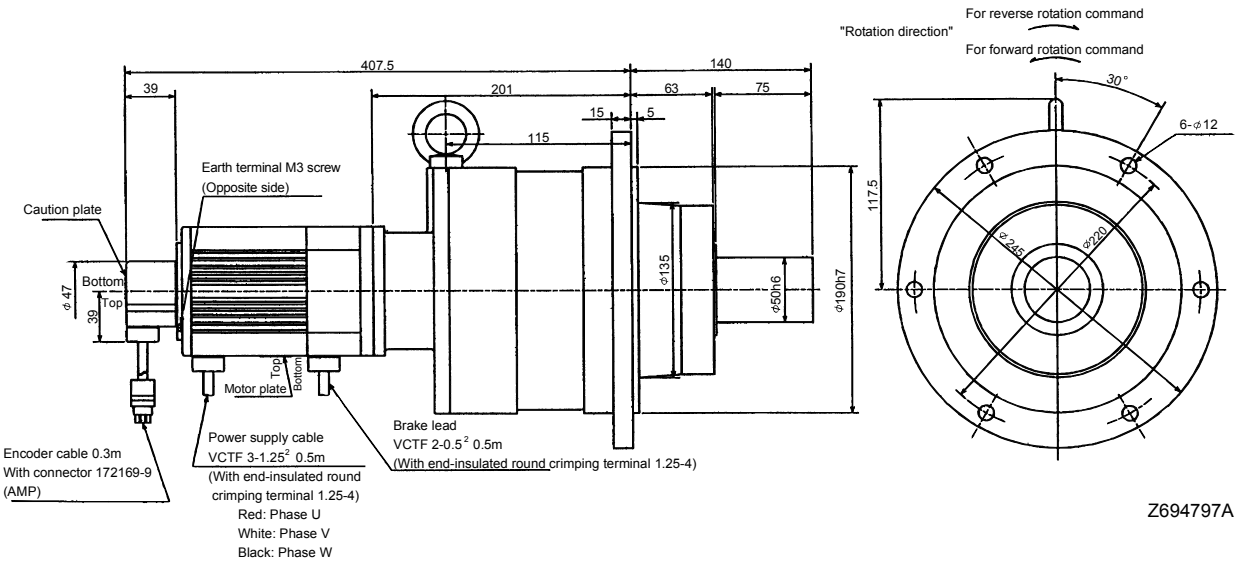


Z694796*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Backlash	Mass [kg]
HA-FF63BG2	600	2.3	BM3-45B-06MES	1/45	3.475	3 min. max.	33.7

(Note)[Unit: mm]



Z694797A

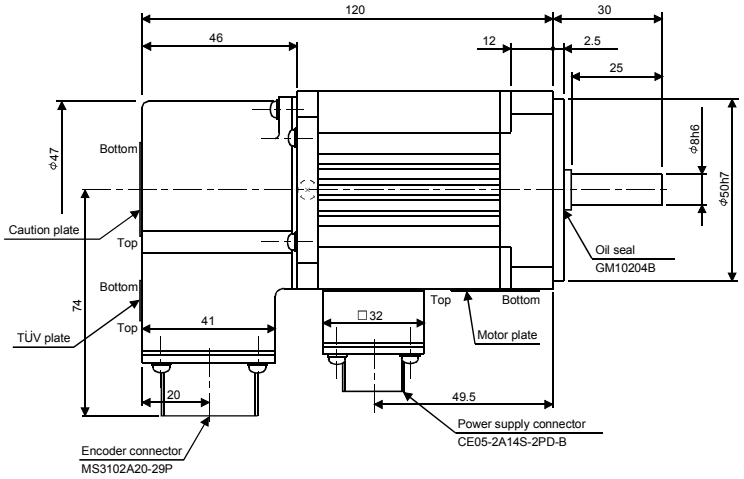
Note: The dimensions without tolerances are reference dimensions.

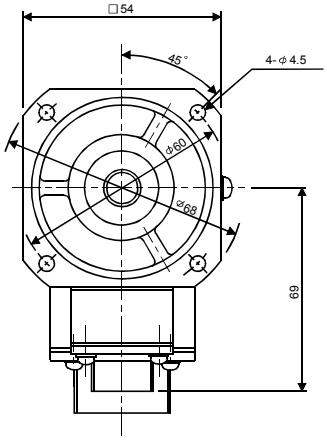
(5) EN・UL/C-UL Standard-Compliant model

(a) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF053C-UE	50	0.063	1.8

(Note)[Unit: mm]



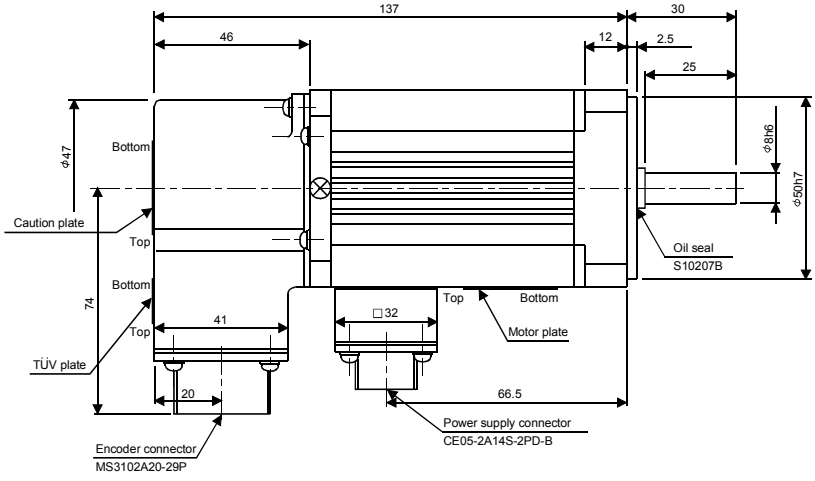


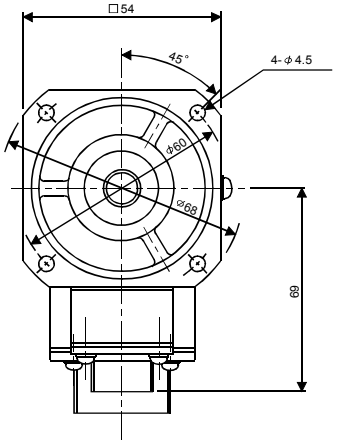
BC07316A

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-FF13C-UE	100	0.10	2

(Note)[Unit: mm]





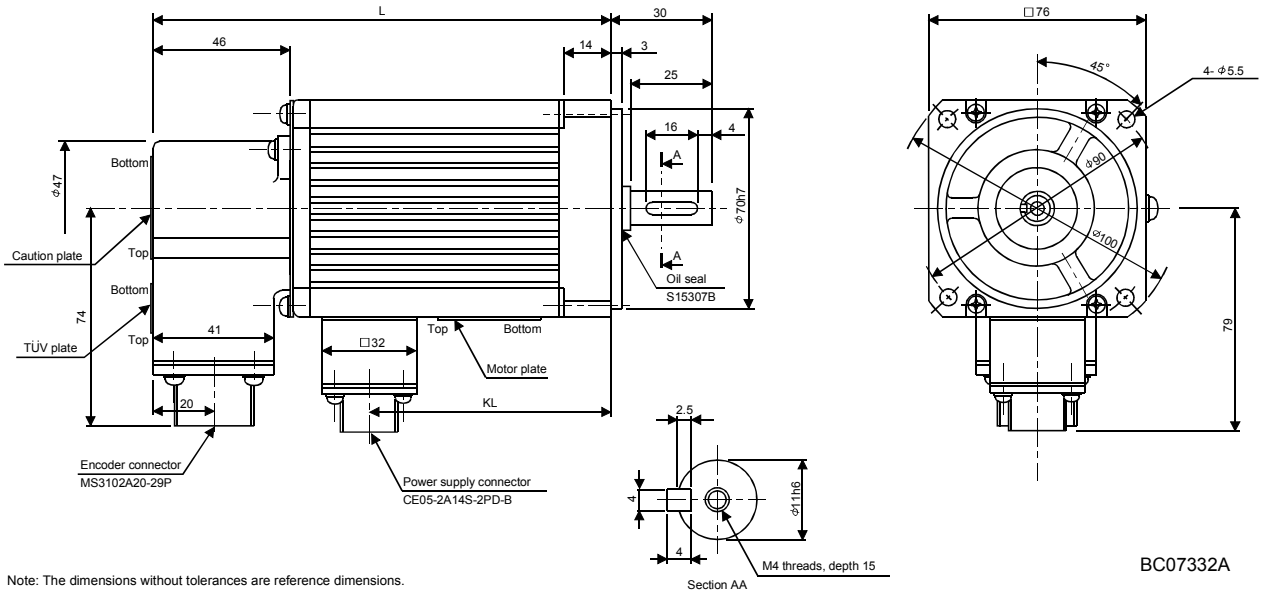
BC07331A

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
		L	KL		
HA-FF23C-UE	200	145	71.5	0.35	2.6
HA-FF33C-UE	300	162	89	0.50	2.9

(Note)[Unit: mm]

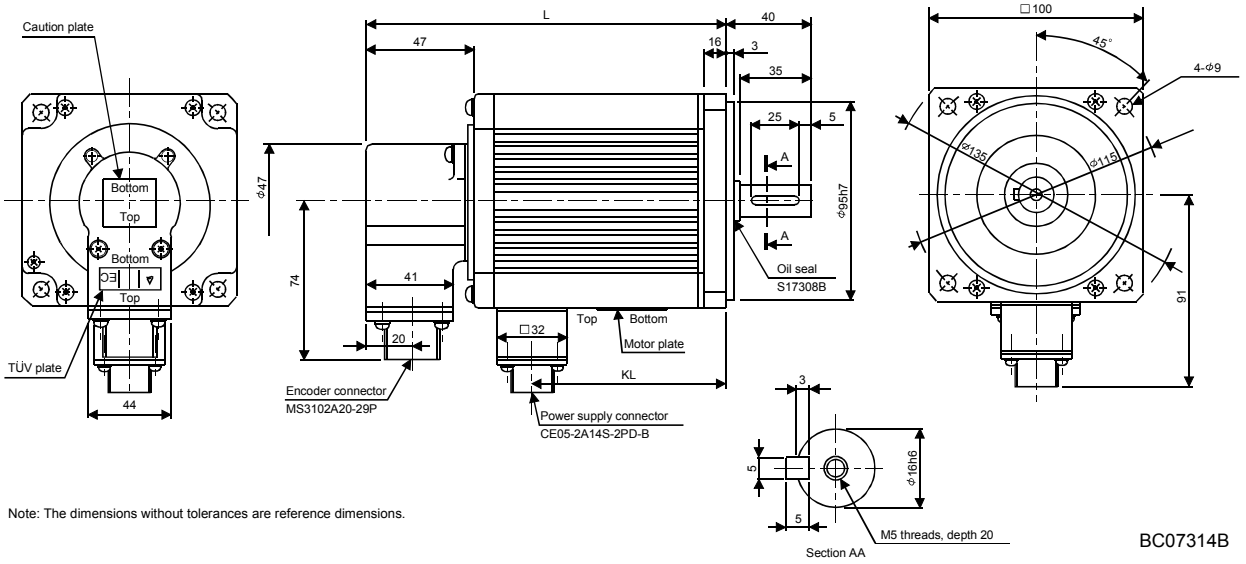


BC07332A

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions		Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
		L	KL		
HA-FF43C-UE	400	169	93	0.98	4.7
HA-FF63C-UE	600	184	108	1.2	5.3

(Note)[Unit: mm]



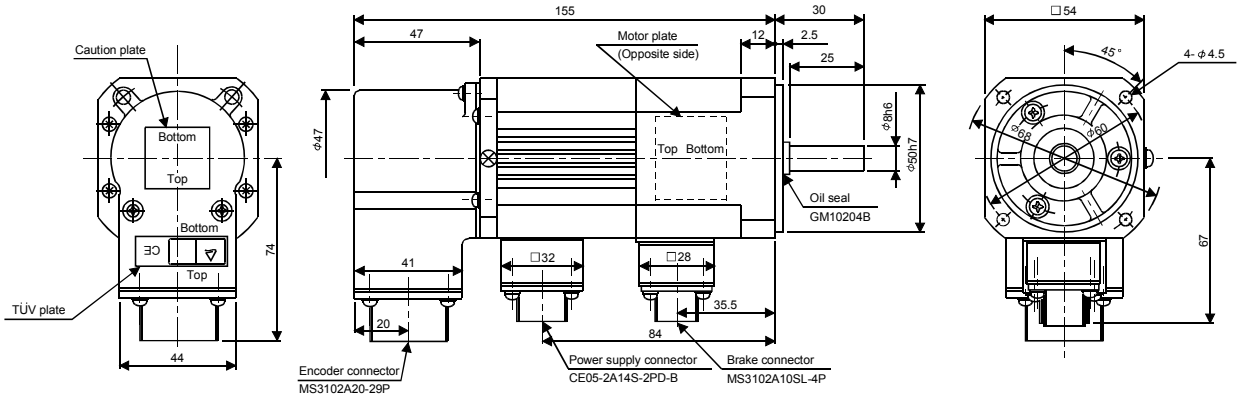
BC07314B

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Inertia Moment J[×10⁻⁴kg・m²]	Brake static friction torque [N・m]	Mass [kg]
HA-FF053CB-UE	50	0.08	0.39	2.1

(Note)[Unit: mm]

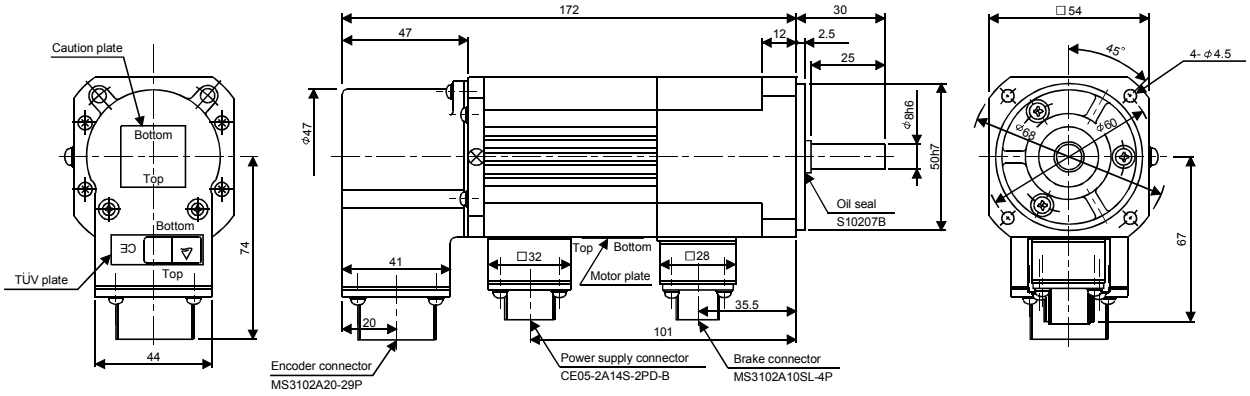


BC08269A

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Inertia Moment J[×10⁻⁴kg・m²]	Brake static friction torque [N・m]	Mass [kg]
HA-FF13CB-UE	100	0.11	0.39	2.3

(Note)[Unit: mm]



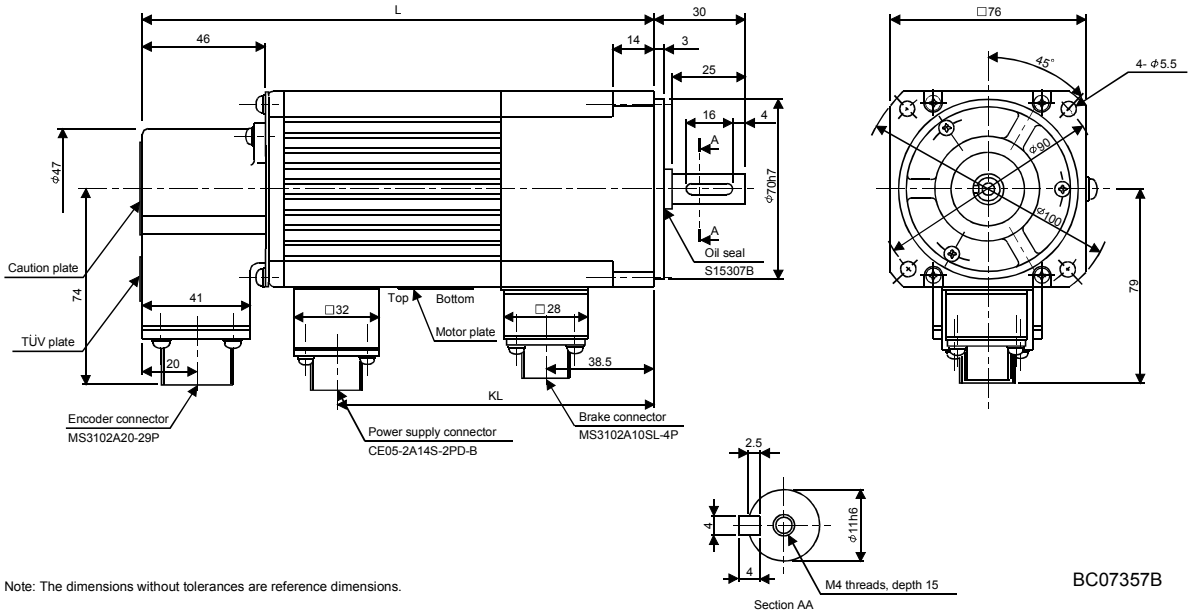
BC07372A

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HA-FF23CB-UE	200	182	109	1.2	0.48	3.5
HA-FF33CB-UE	300	200	127		0.63	3.8

(Note)[Unit: mm]

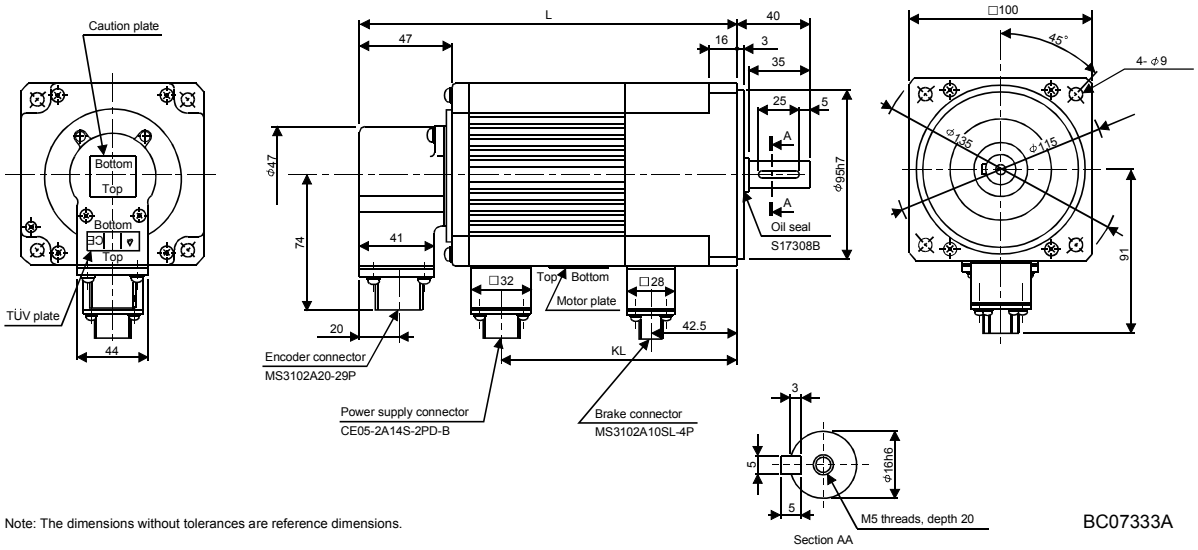


Note: The dimensions without tolerances are reference dimensions.

BC07357B

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HA-FF43CB-UE	400	206	130	2.3	1.33	5.8
HA-FF63CB-UE	600	221	145		1.55	6.4

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

BC07333A

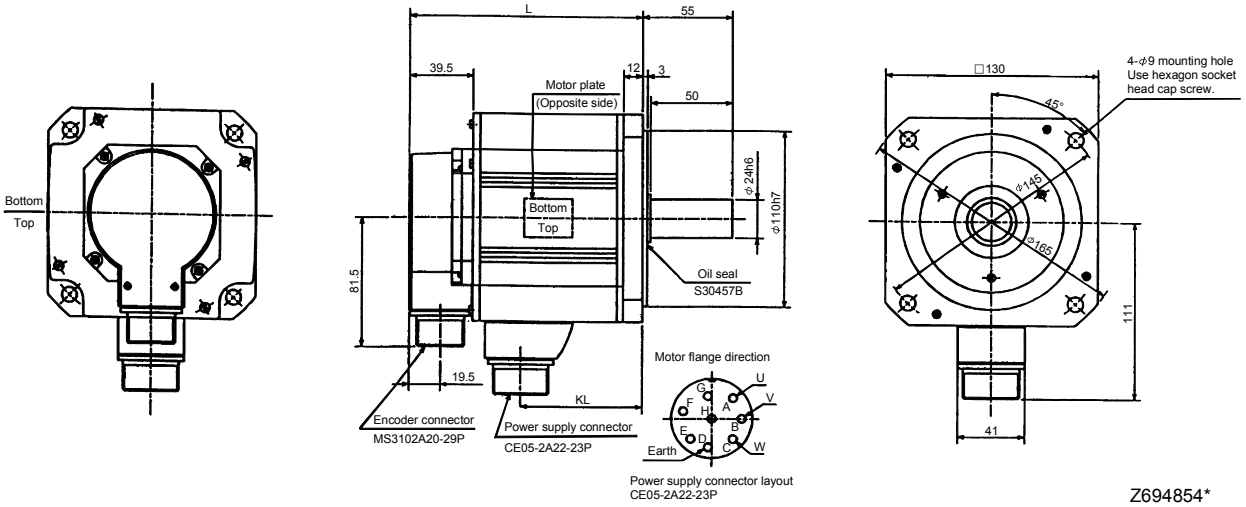
7.1.3 HC-SF・HC-SFS series

If the above indicated value is exceeded, please consult us.

(1) Standard (without electromagnetic brake, without reduction gear)

Model			Output [kW]	Variable dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
				L	KL		
HC-SF52 HC-SF53	HC-SFS52 HC-SFS53	HC-SFS524	0.5	120	51.5	6.6	5.0
HC-SF102 HC-SF103	HC-SFS102 HC-SFS103	HC-SFS1024	1.0	145	76.5	13.7	7.0
HC-SF81	HC-SFS81		0.85	170	101.5	20	9.0
HC-SF152 HC-SF153	HC-SFS152 HC-SFS153	HC-SFS1524	1.5				

(Note)[Unit: mm]

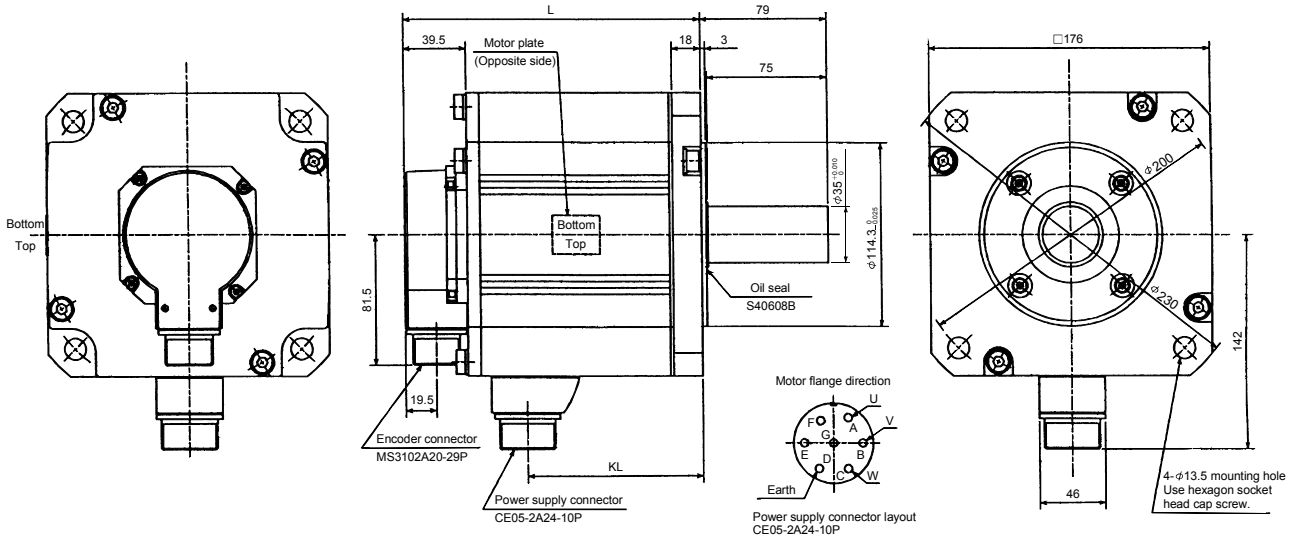


Z694854*
(BC11651*・BC11757*・BC11768*)

Note: The dimensions without tolerances are reference dimensions.

Model			Output [kW]	Variable dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
				L	H		
HC-SF121	HC-SFS121		1.2	145	68.5	42.5	12.0
HC-SF202 HC-SF203	HC-SFS202 HC-SFS203	HC-SFS2024	2.0				
HC-SF201	HC-SFS201		2.0	187	110.5	82.0	19.0
HC-SF352 HC-SF353	HC-SFS352 HC-SFS353	HC-SFS3524	3.5				

(Note)[Unit: mm]



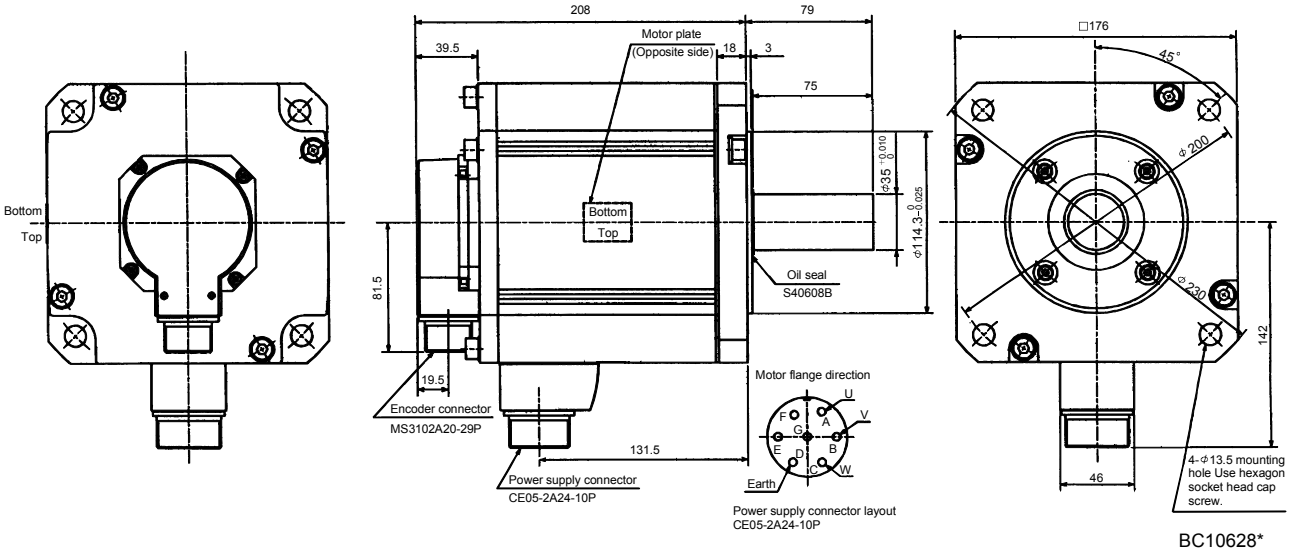
Z695393A*
(BC11769*・BC11652*・BC11758*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Mass [kg]
HC-SF301 HC-SFS301	3.0	101	23

(Note)[Unit: mm]

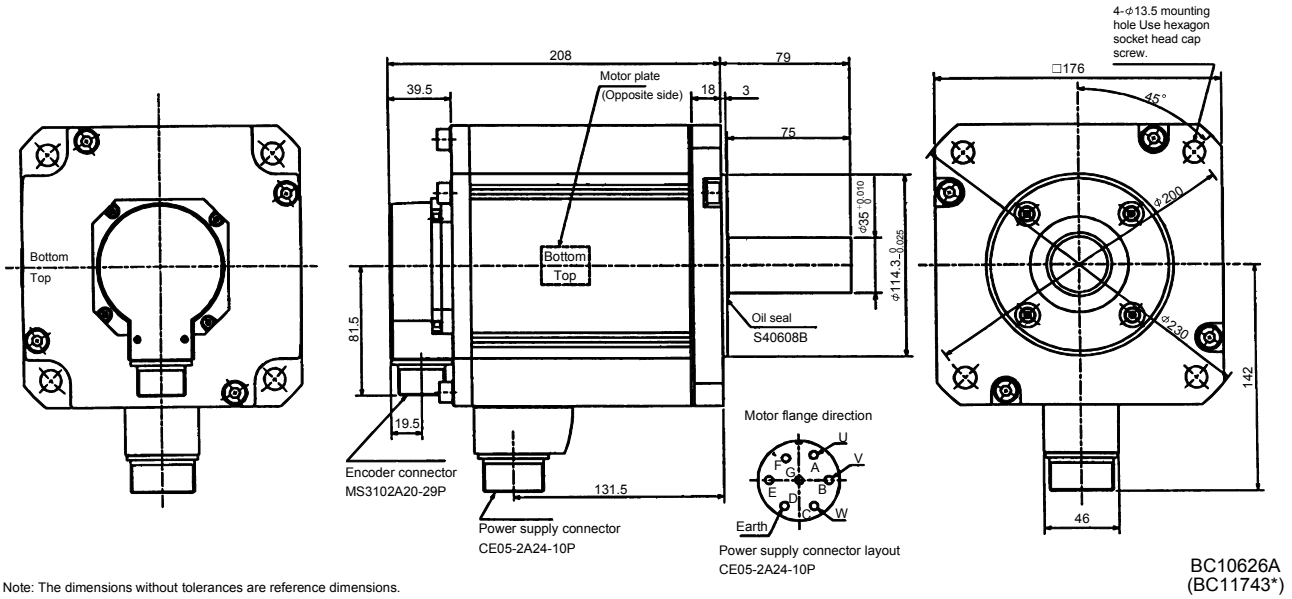


BC10628*
(BC11769*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Mass [kg]
HC-SF502 HC-SFS502 HC-SFS5024	5.0	101	23

(Note)[Unit: mm]

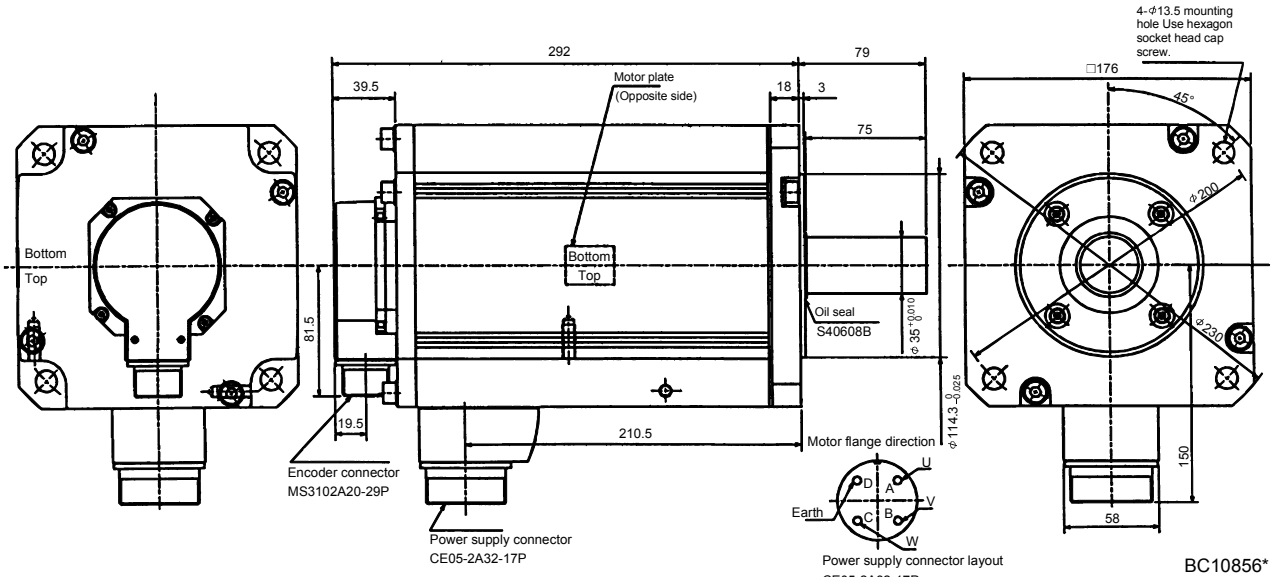


BC10626A
(BC11743*)

Note: The dimensions without tolerances are reference dimensions.

Model			Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702	HC-SFS702	HC-SFS7024	7.0	160	32

(Note)[Unit: mm]



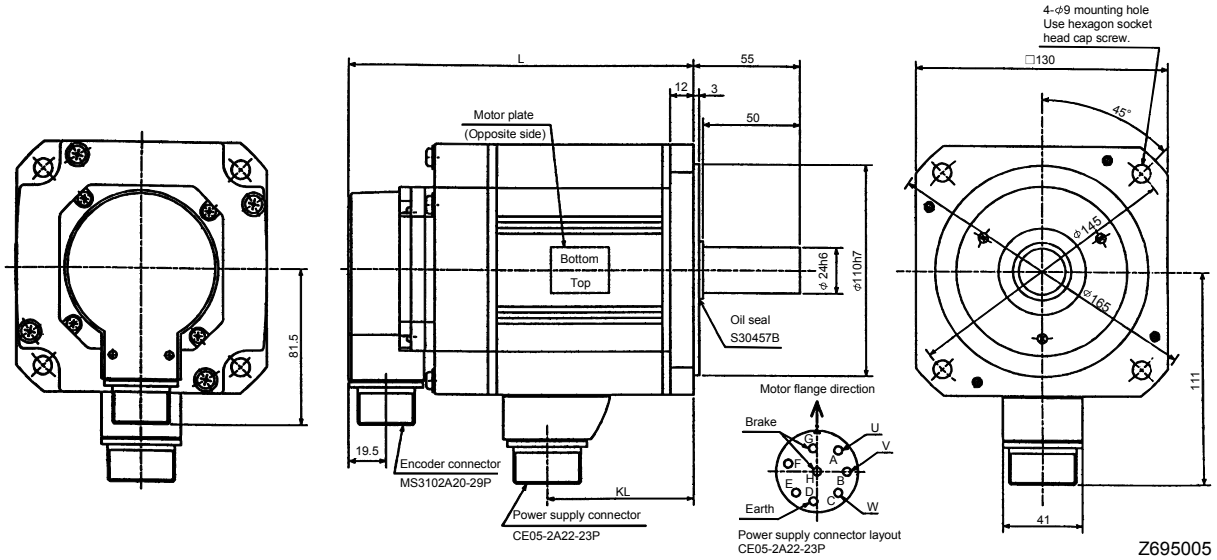
BC10856*
(BC11744*)

Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model			Output [kW]	Variable dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
				L	KL			
HC-SF52B HC-SF53B	HC-SFS52B HC-SFS53B	HC-SFS524B	0.5	153	51.5	8.5	8.3	7.5
HC-SF102B HC-SF103B	HC-SFS102B HC-SFS103B	HC-SFS1024B	1.0	178	76.5	8.5	15.4	9.5
HC-SF81B	HC-SFS81B		0.85	203	101.5	8.5	21.7	11.5
HC-SF152B HC-SF153B	HC-SFS152B HC-SFS153B	HC-SFS1524B	1.5					

(Note)[Unit: mm]



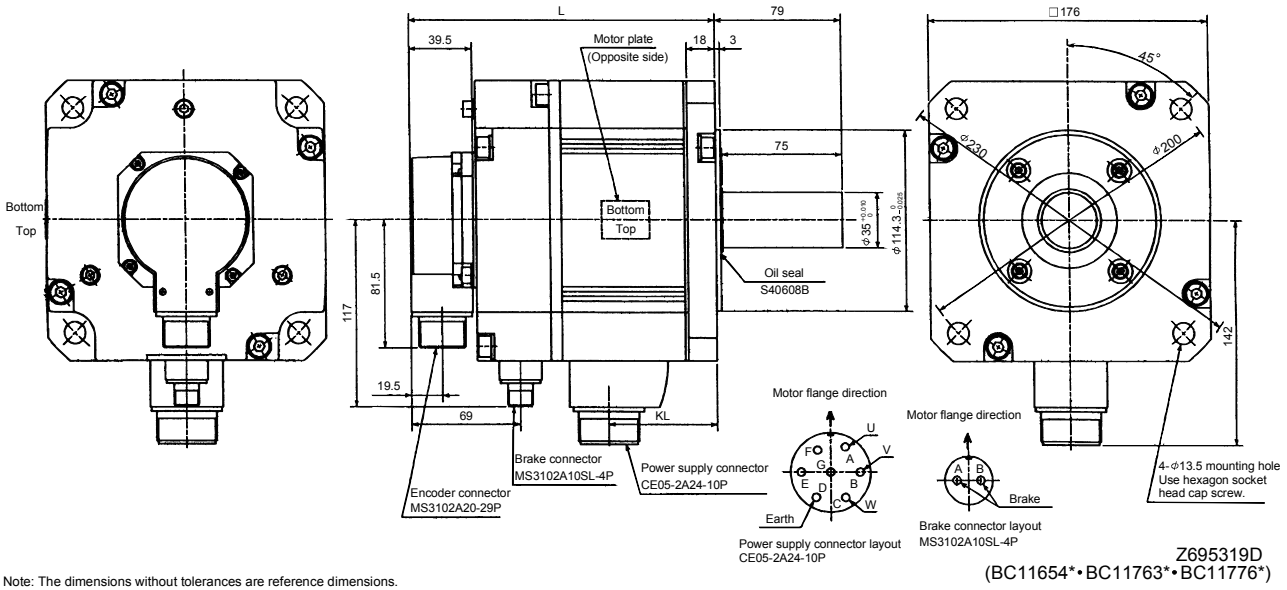
Z695005
(BC11653*・BC11762*・BC11775*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Variable dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
			L	KL			
HC-SF121B	HC-SFS121B	1.2	193	68.5	43.1	52.5	18.0
HC-SF202B HC-SF203B	HC-SFS202B HC-SFS203B HC-SFS2024B	2.0					
HC-SF201B	HC-SFS201B	2.0	235	110.5	43.1	92.0	25.0
HC-SF352B HC-SF353B	HC-SFS352B HC-SFS353B HC-SFS3524B	3.5					

(Note)[Unit: mm]

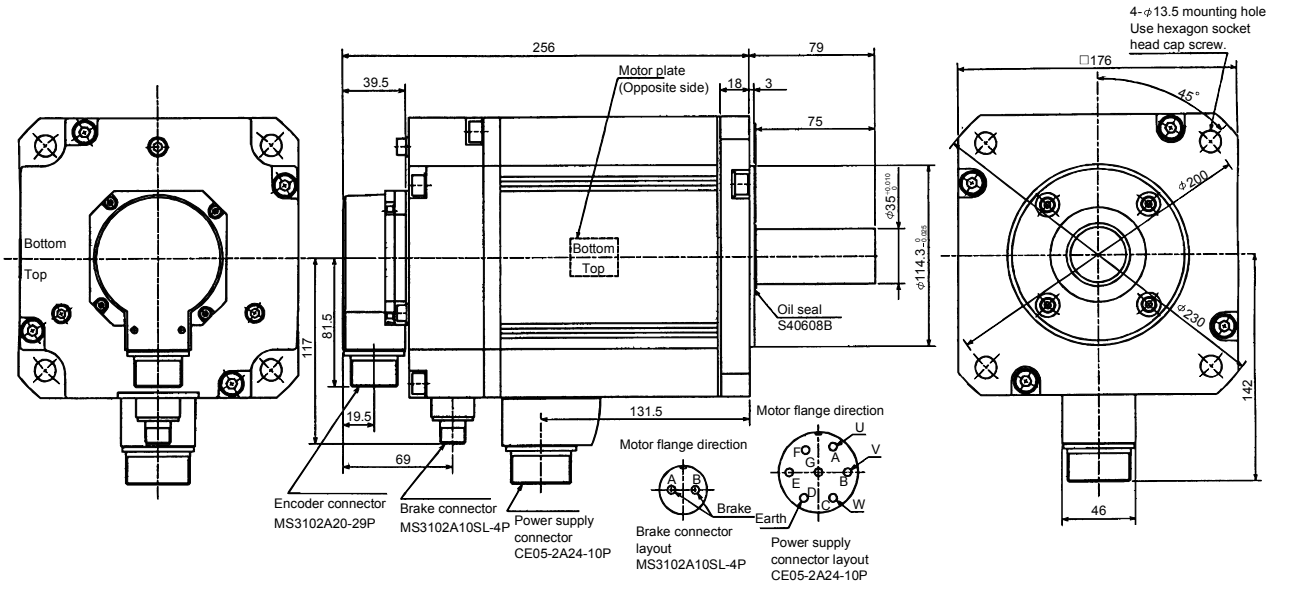


Z695319D
(BC11654*・BC11763*・BC11776*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF301B	HC-SFS301B	3.0	43.1	111	29.0

(Note)[Unit: mm]

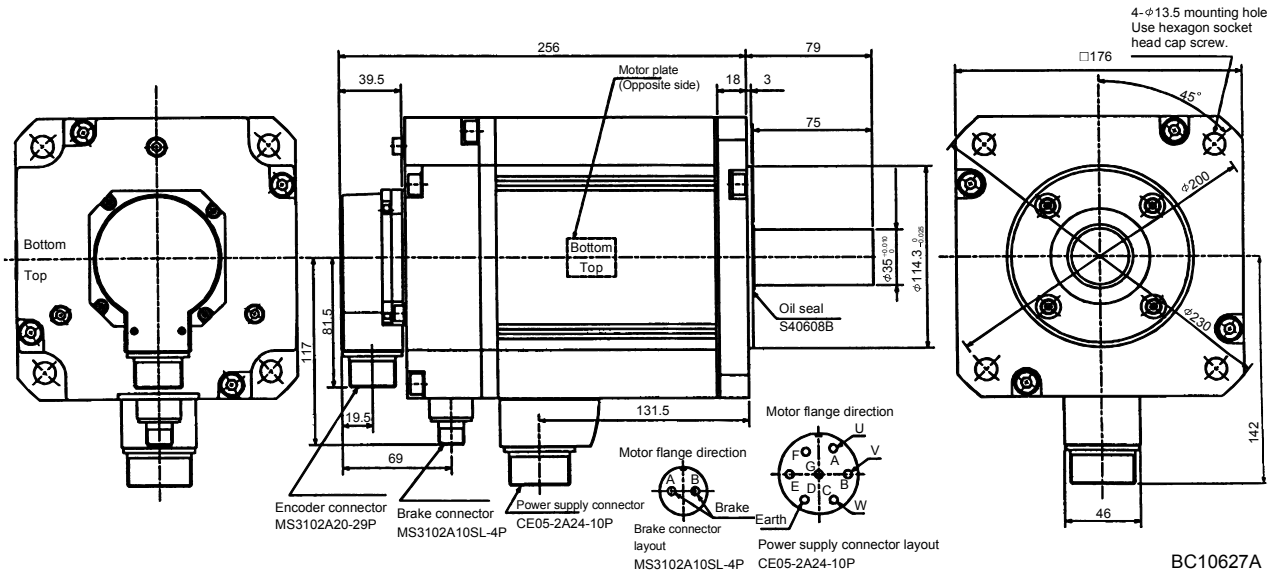


BC10823*
(BC11776*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF502B	HC-SFS502B HC-SFS5024B	5.0	43.1	111	29.0

(Note)[Unit:mm]

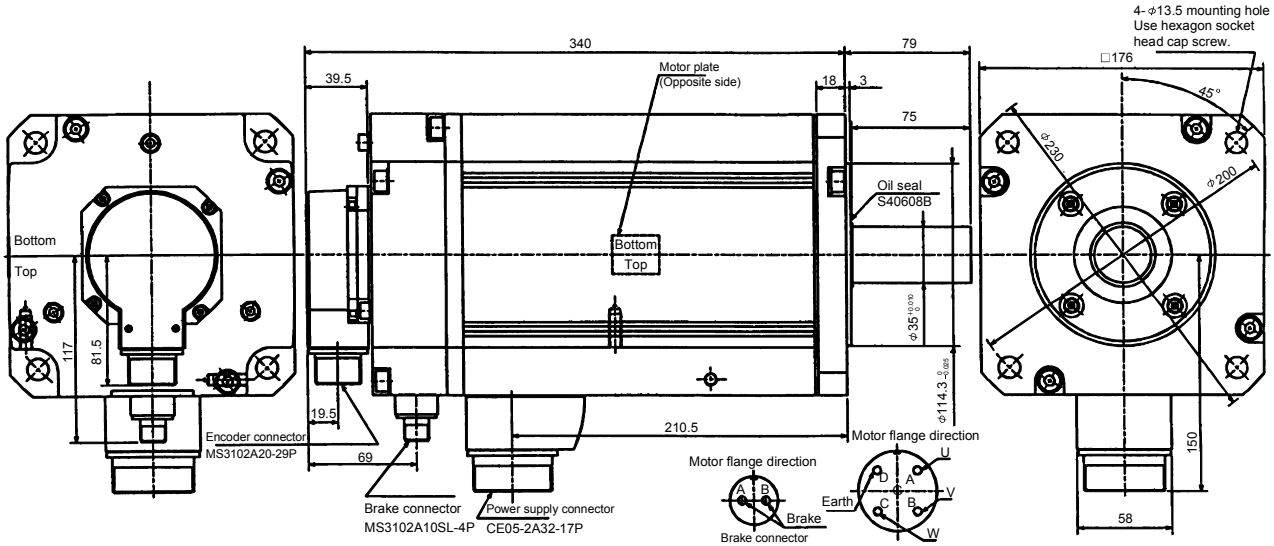


BC10627A
(BC11750*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702B	HC-SFS702B HC-SFS7024B	7.0	43.1	170	38.0

(Note)[Unit:mm]



BC10857*
(BC11751*)

Note: The dimensions without tolerances are reference dimensions.

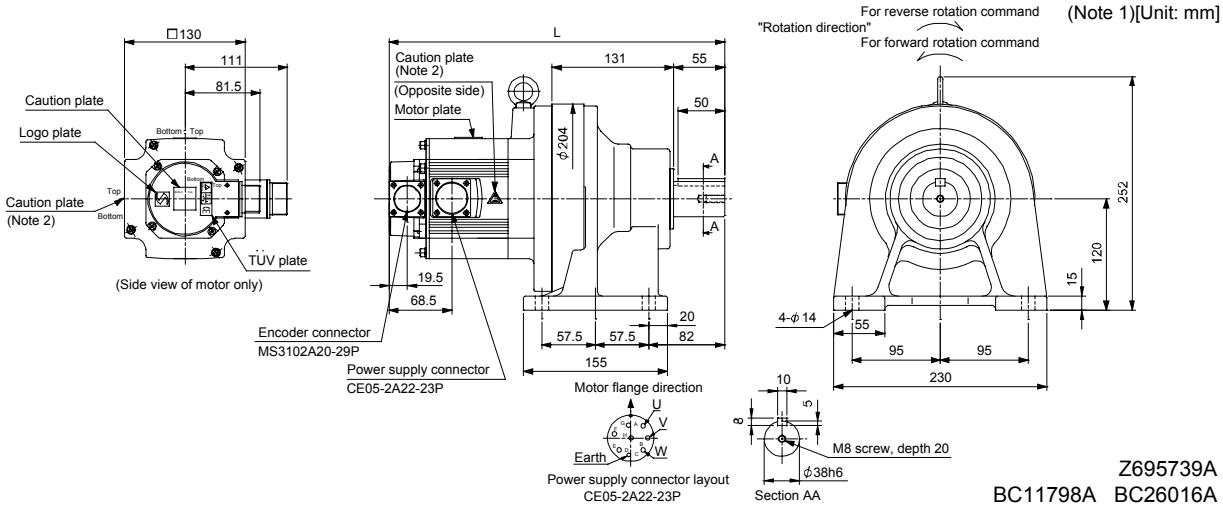
(3) With reduction gear for general industrial machine (leg type)

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/35	7.5	338	28
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/43	7.45	338	28
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/59	7.43	338	28
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/6	16.8	363	30
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/11	15.3	363	30
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/17	14.9	363	30
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/29	14.6	363	30
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/35	14.6	363	30
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/6	23.1	388	32
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/11	21.5	388	32
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/17	21.2	388	32

(Note 1)[Unit: mm]

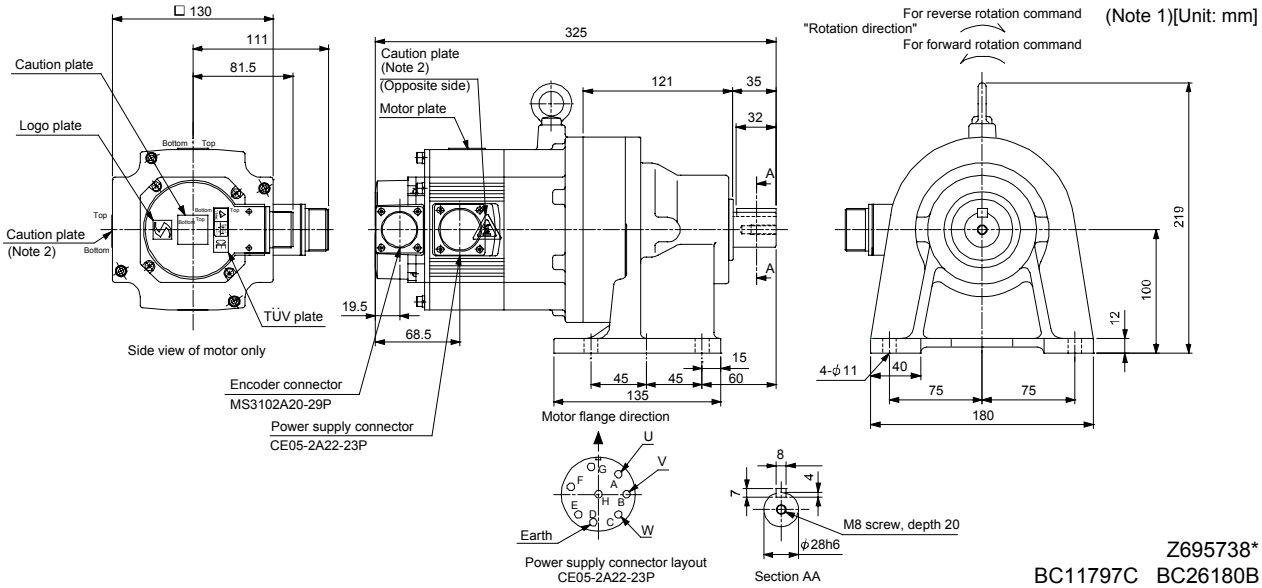


Z695739A
BC11798A BC26016A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/6	7.33	21
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/11	6.95	21
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/17	6.85	21
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/29	6.78	21

(Note 1)[Unit: mm]



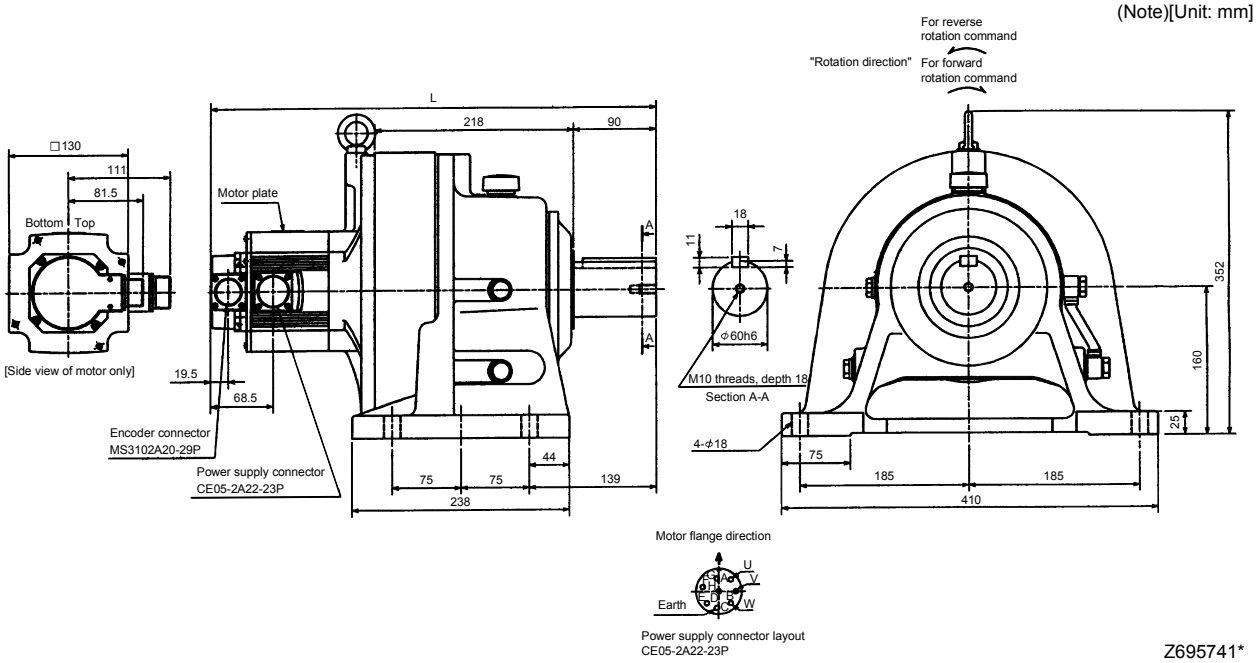
Z695738*
BC11797C BC26180B

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/59	19.48	488	90
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/43	25.8	513	92
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/59	25.73	513	92

(Note)[Unit: mm]

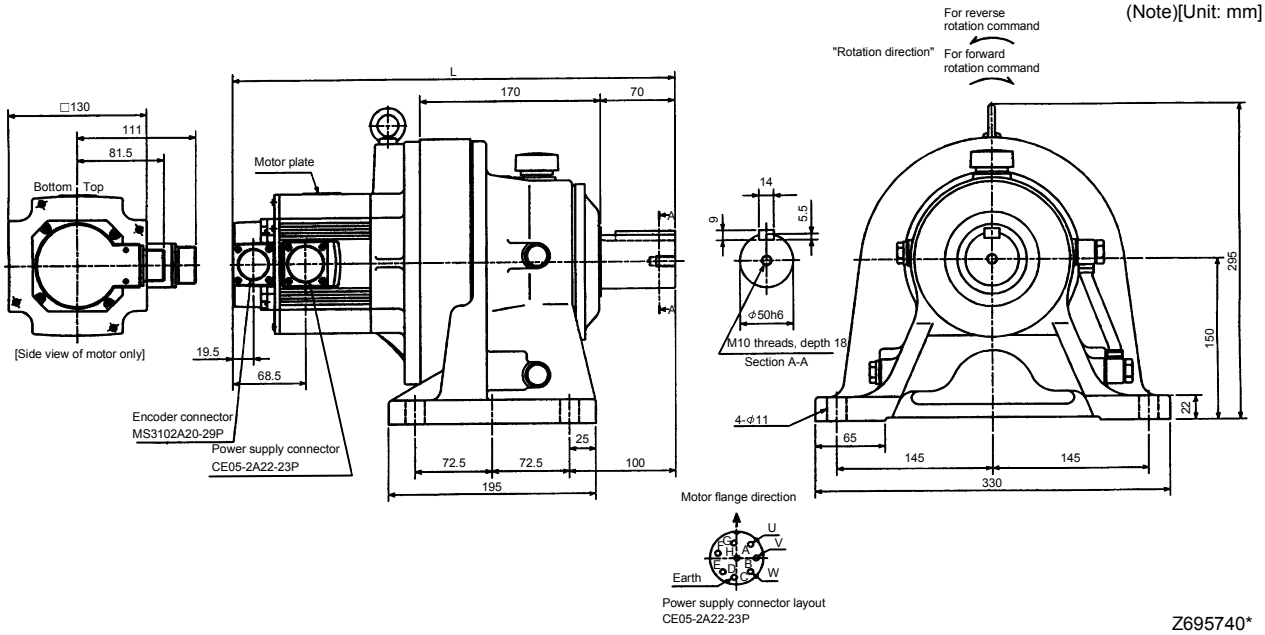


Z695741*
(BC11800*)

Note: The dimensions without tolerances are reference dimensions.

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/43	15.65	416	51
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/29	22.08	441	53
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/35	22.03	441	53

(Note)[Unit: mm]



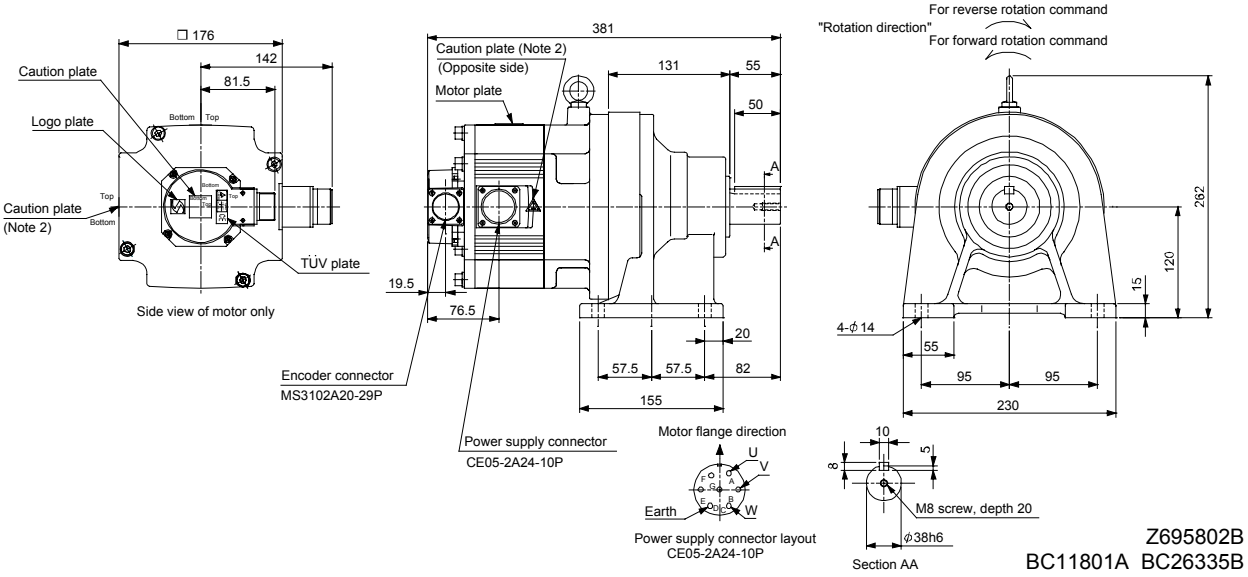
Z695740*
(BC11799*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/6	45.6	35
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/11	44.1	35
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/17	43.7	35

(Note 1)[Unit: mm]

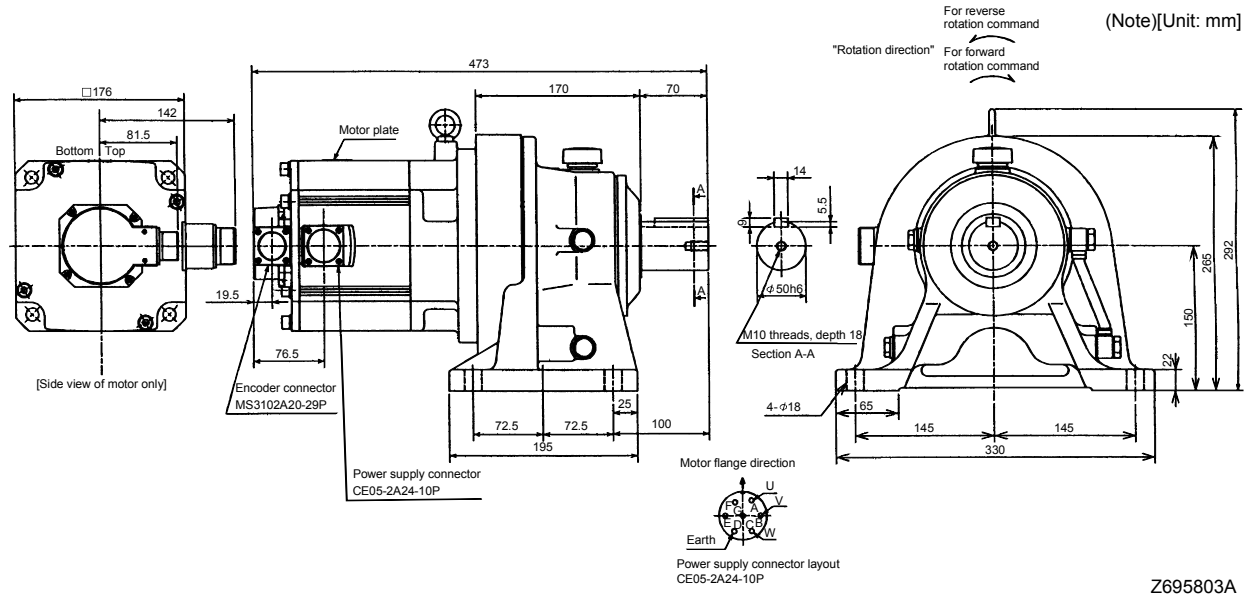


Z695802B
BC11801A BC26335B

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/6	90.1	60
HC-SF352G1H	HC-SFS352G1H HC-SFS3524 G1H	3.5	1/11	86.2	60
HC-SF352G1H	HC-SFS352G1H HC-SFS3524 G1H	3.5	1/17	85.0	60

(Note)[Unit: mm]



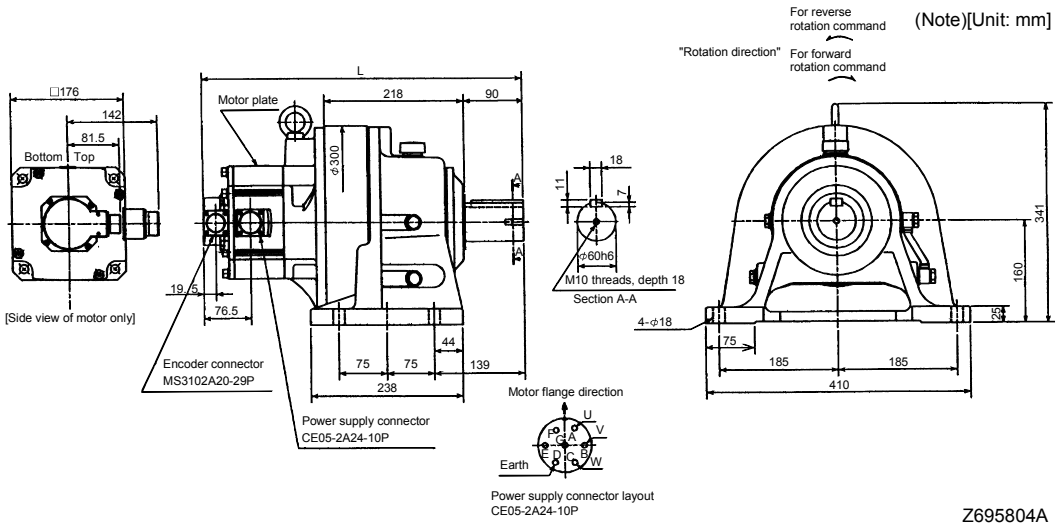
Z695803A
(BC11803*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/29	48.9	498	91
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/35	48.6	498	91
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/43	48.4	498	91
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/59	48.3	498	91
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/29	88.4	540	98
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/35	88.1	540	98

(Note)[Unit: mm]

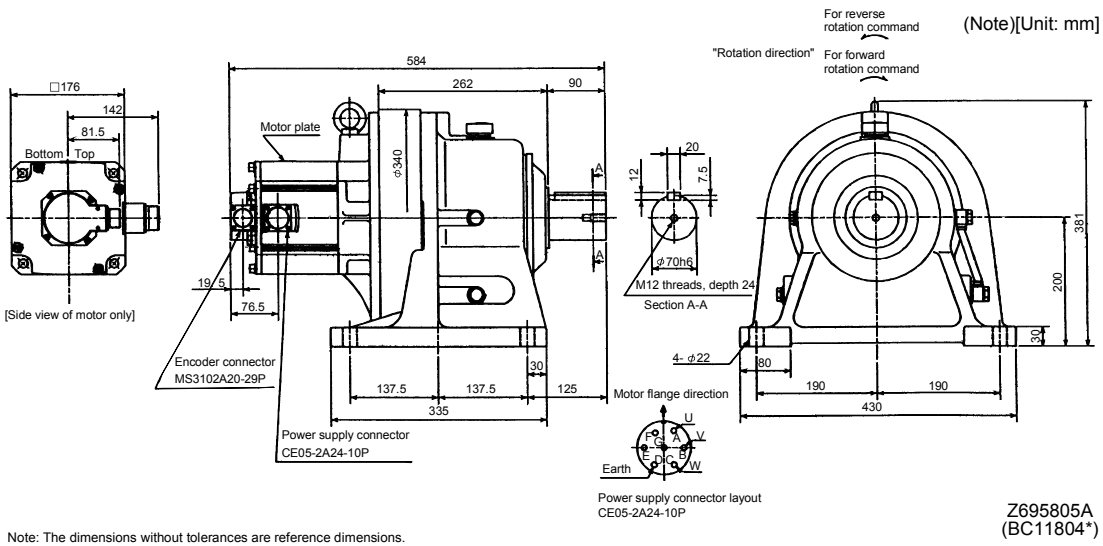


Z695804A
(BC11802*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/43	106.5	139
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/59	105.9	139

(Note)[Unit: mm]

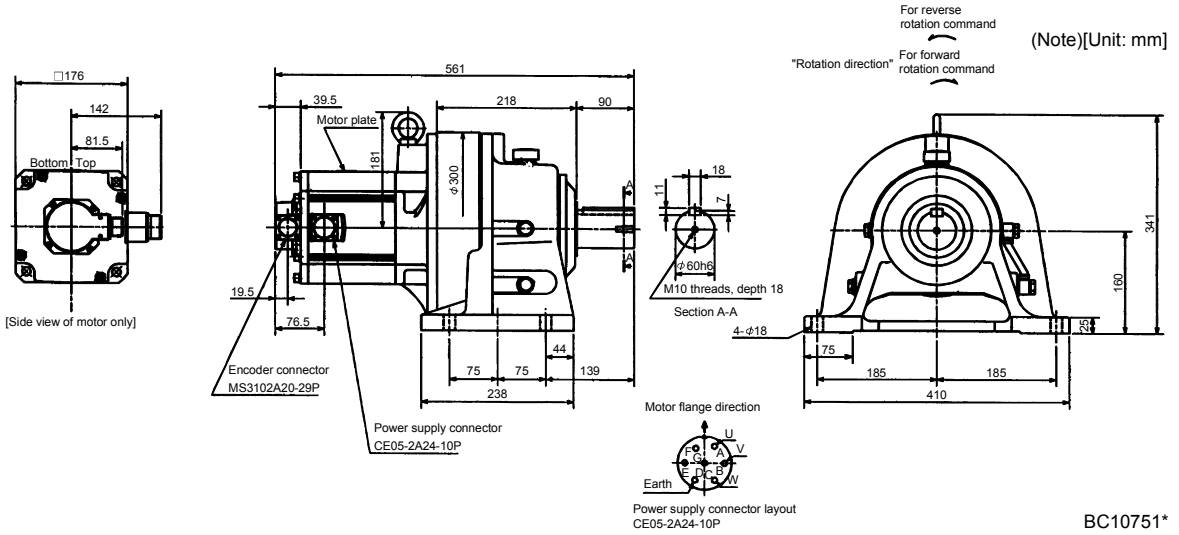


Z695805A
(BC11804*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

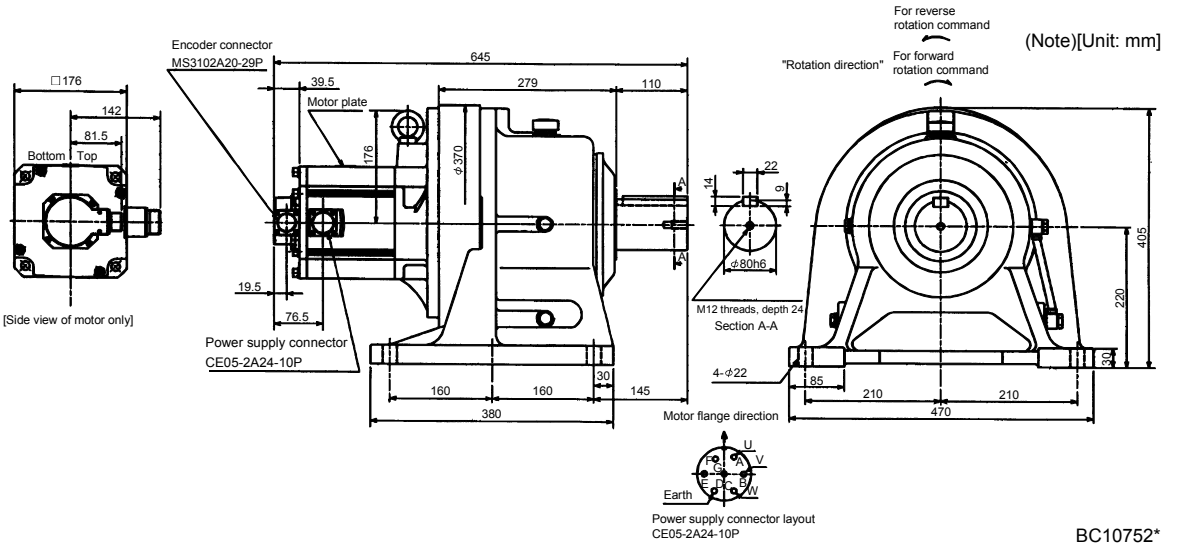
Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/11	113.4	102
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/17	109.4	102



BC10751*
(BC11805*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/29	138.5	171
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/35	138.0	171
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/43	137.0	171

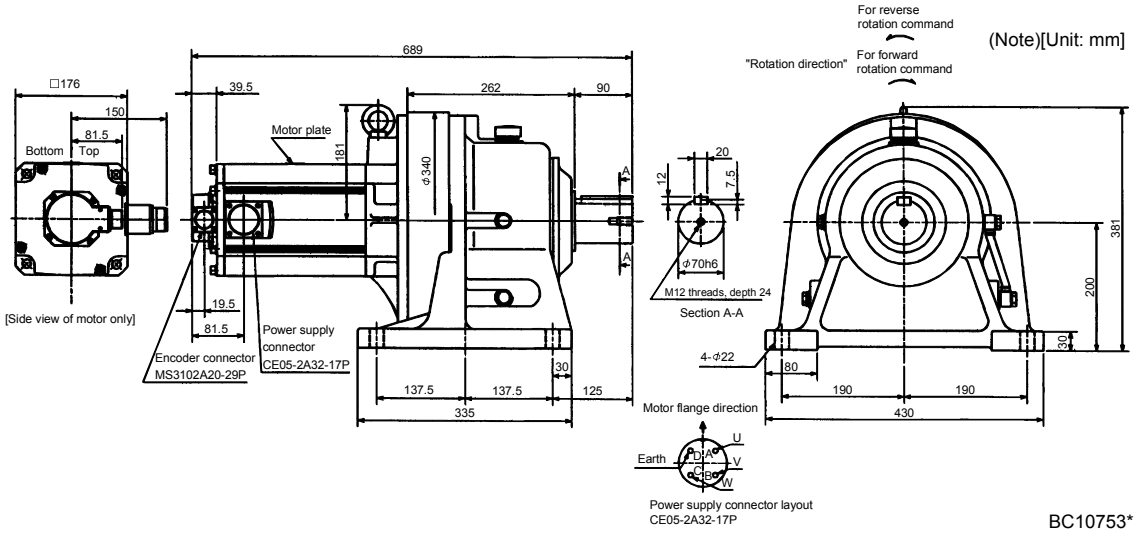


BC10752*
(BC11806*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

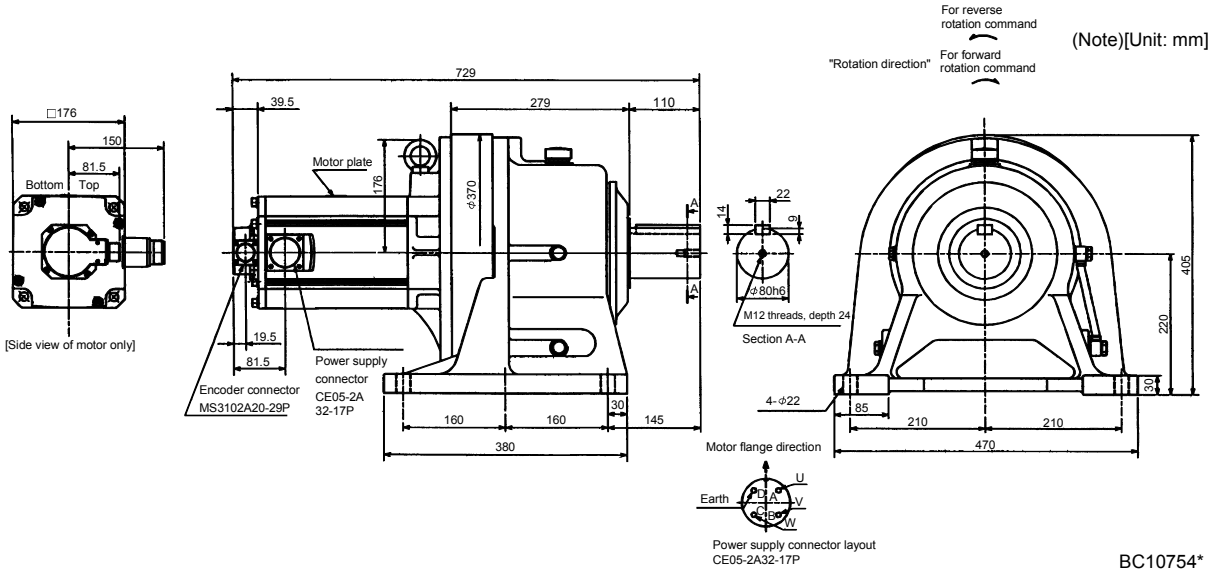
Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/11	198.8	138
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/17	190.0	138



BC10753*
(BC11807*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/29	197.5	180
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/35	197.0	180

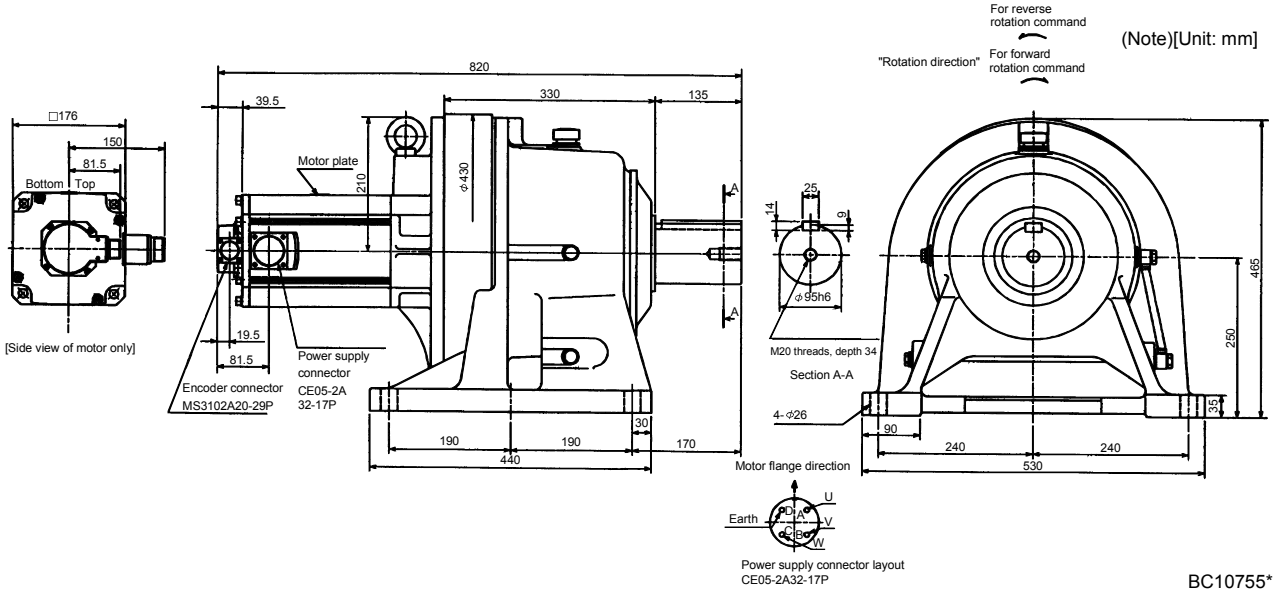


BC10754*
(BC11808*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/43	256.8	261

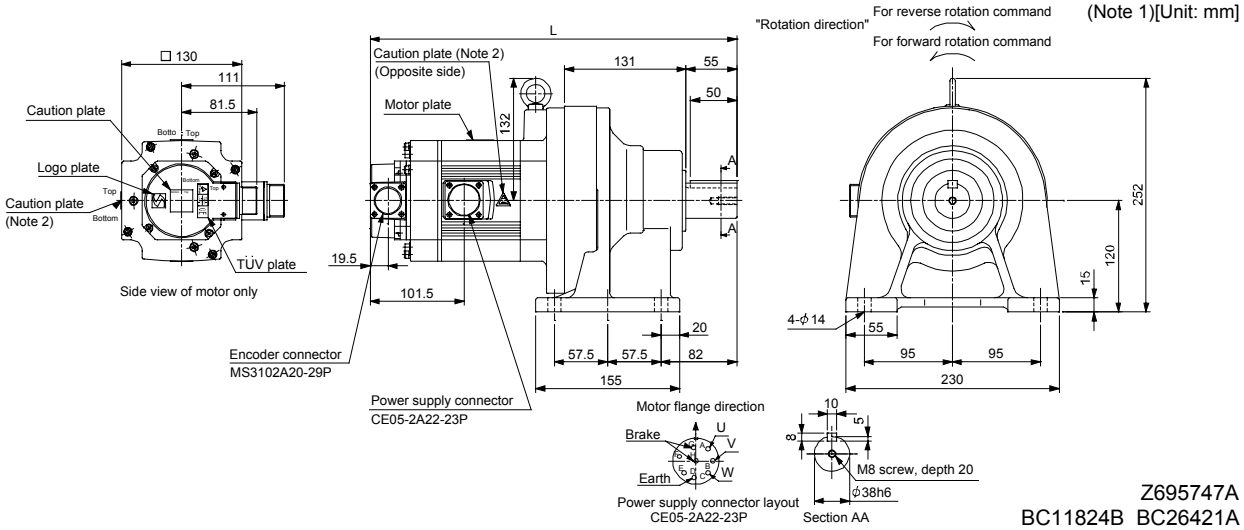


Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/35	9.2	371	33	8.3
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/43	9.15	371	33	8.3
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/59	9.13	371	33	8.3
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/6	18.5	396	35	8.3
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/11	17.0	396	35	8.3
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/17	16.6	396	35	8.3
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/29	16.3	396	35	8.3
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/35	16.3	396	35	8.3
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/6	24.8	421	37	8.3
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/11	23.2	421	37	8.3
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/17	22.9	421	37	8.3

(Note 1)[Unit: mm]

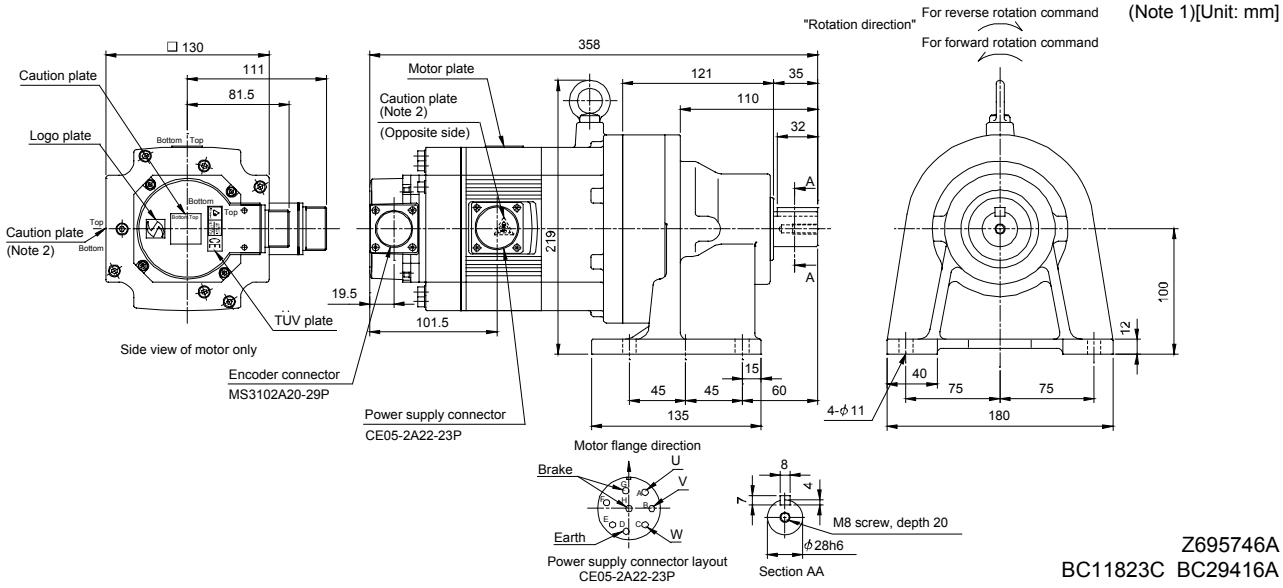


Z695747A
BC11824B BC26421A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/6	9.03	23	8.3
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/11	8.65	23	8.3
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/17	8.55	23	8.3
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/29	8.48	23	8.3

(Note 1)[Unit: mm]

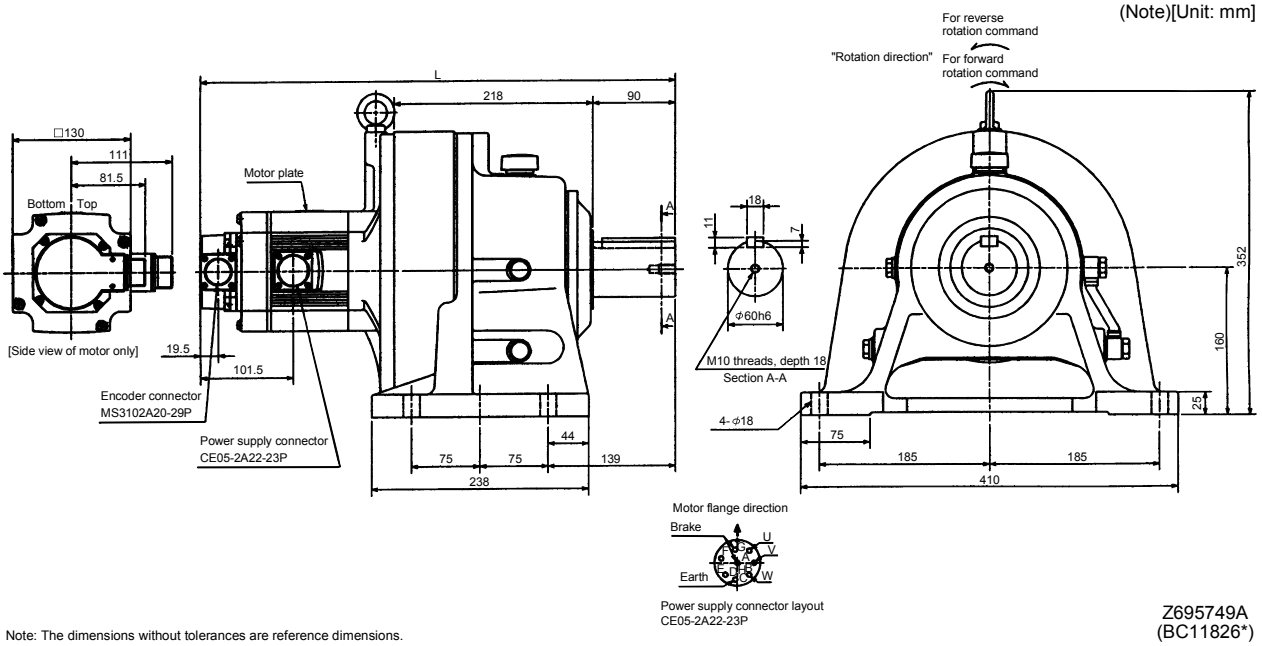


Z695746A
BC11823C BC29416A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF102BG1H	HC-SFS102BG1H HC-SFS1024BG1H	1.0	1/59	21.18	521	92	8.3
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/43	27.5	546	94	8.3
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/59	27.43	546	94	8.3

(Note)[Unit: mm]

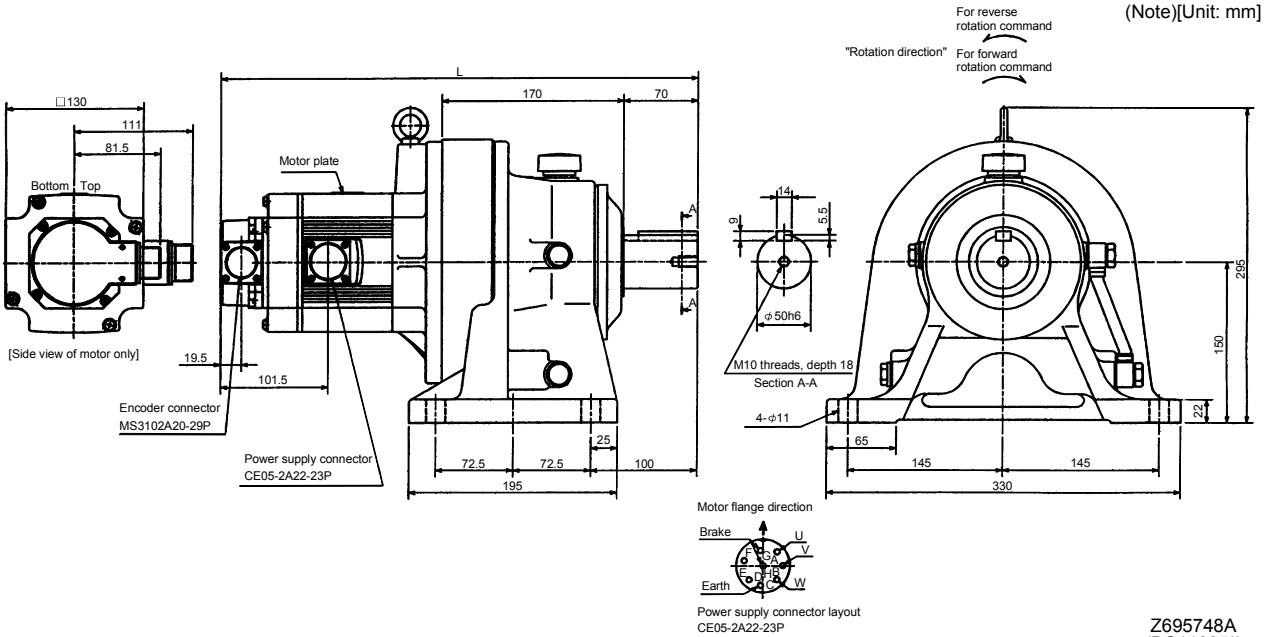


Note: The dimensions without tolerances are reference dimensions.

Z695749A
(BC11826*)

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF102BG1H	HC-SFS102BG1H HC-SFS1024BG1H	1.0	1/43	17.35	449	53	8.3
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/29	23.78	474	55	8.3
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/35	23.73	474	55	8.3

(Note)[Unit: mm]

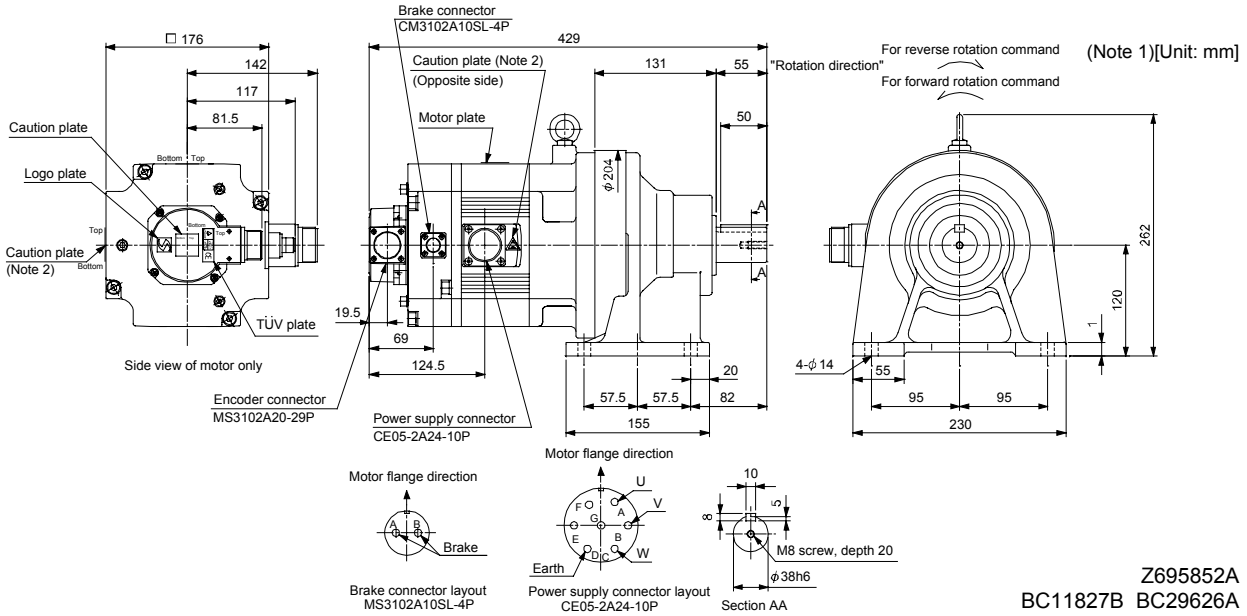


Note: The dimensions without tolerances are reference dimensions.

Z695748A
(BC11825*)

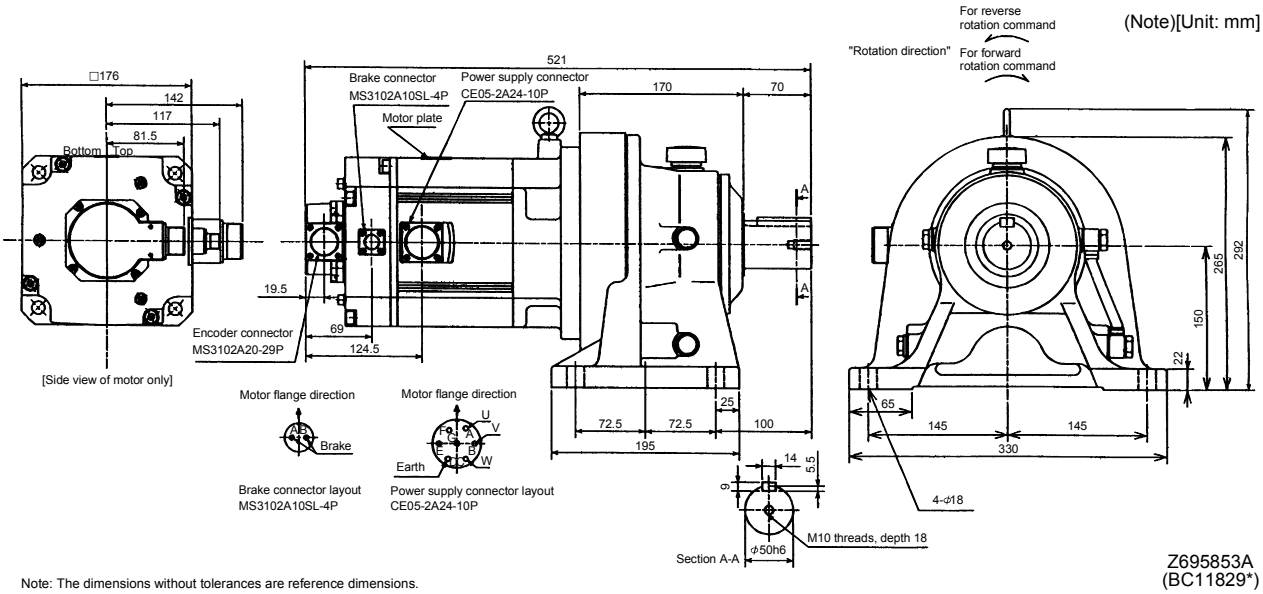
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/6	55.6	41	43.1
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/11	54.1	41	43.1
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/17	53.7	41	43.1



Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/6	100.1	66	43.1
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/11	96.2	66	43.1
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/17	95.0	66	43.1

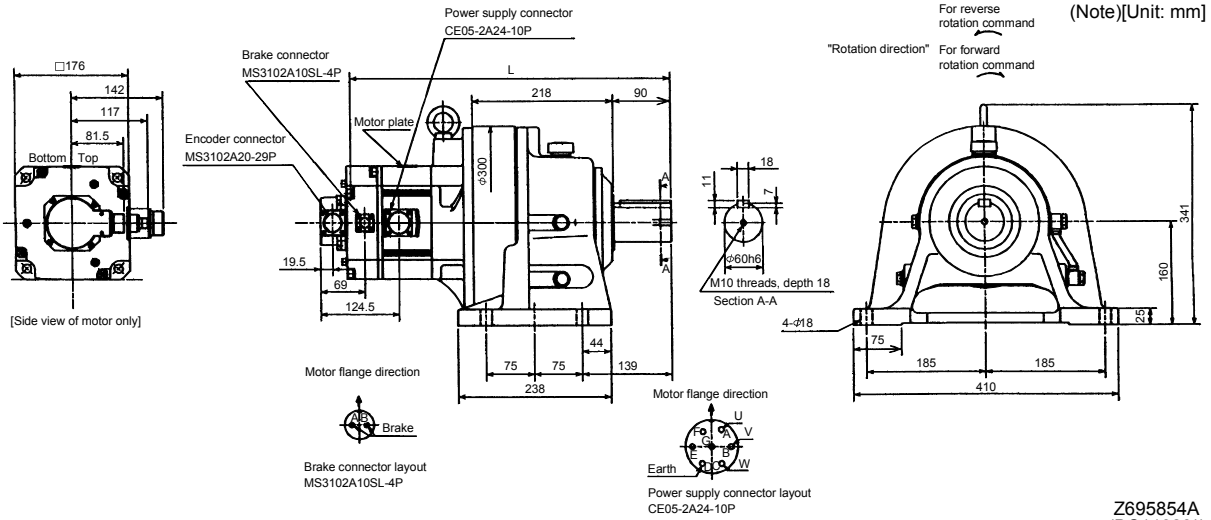


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/29	58.9	546	97	43.1
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/35	58.6	546	97	43.1
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/43	58.4	546	97	43.1
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/59	58.3	546	97	43.1
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/29	98.4	588	104	43.1
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/35	98.1	588	104	43.1

(Note)[Unit: mm]

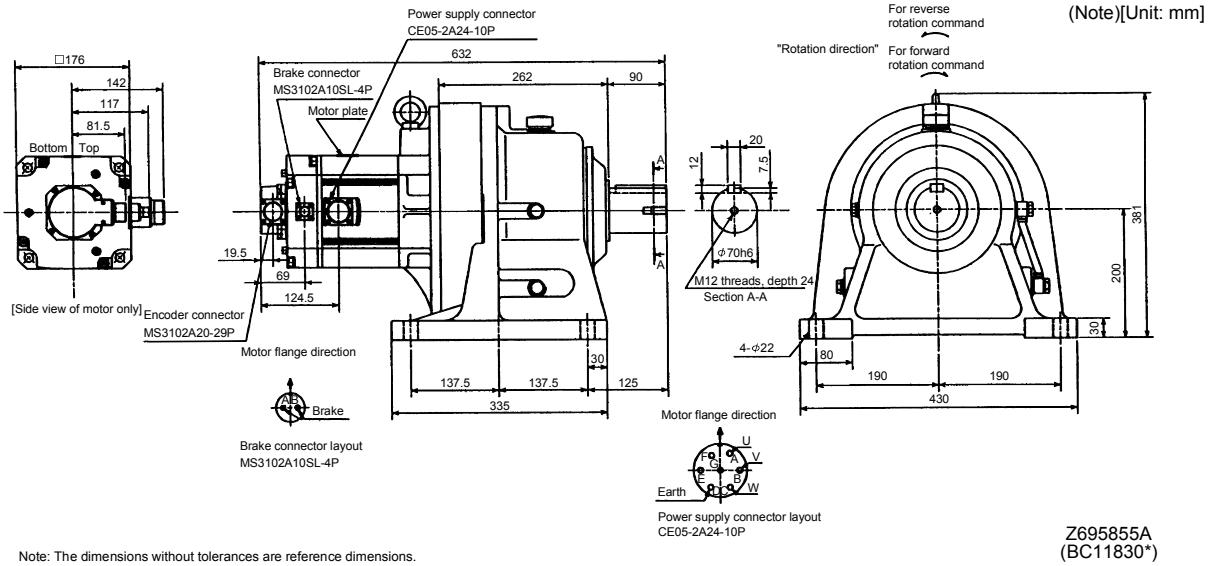


Z695854A
(BC11828*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/43	116.5	145	43.1
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/59	115.9	145	43.1

(Note)[Unit: mm]



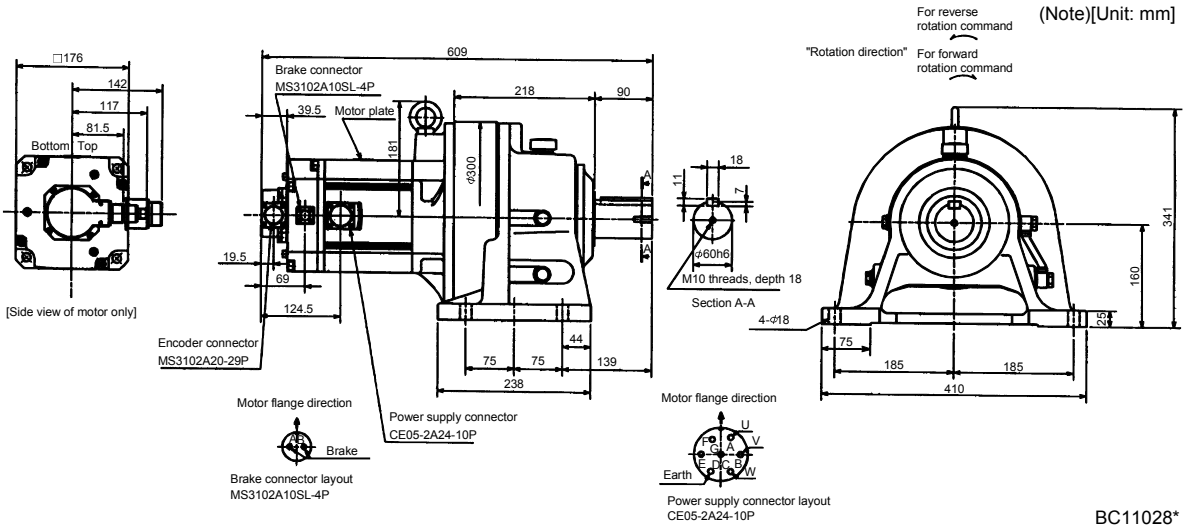
Z695855A
(BC11830*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SFS502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/11	123.4	108	43.1
HC-SFS502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/17	119.4	108	43.1

(Note)[Unit: mm]

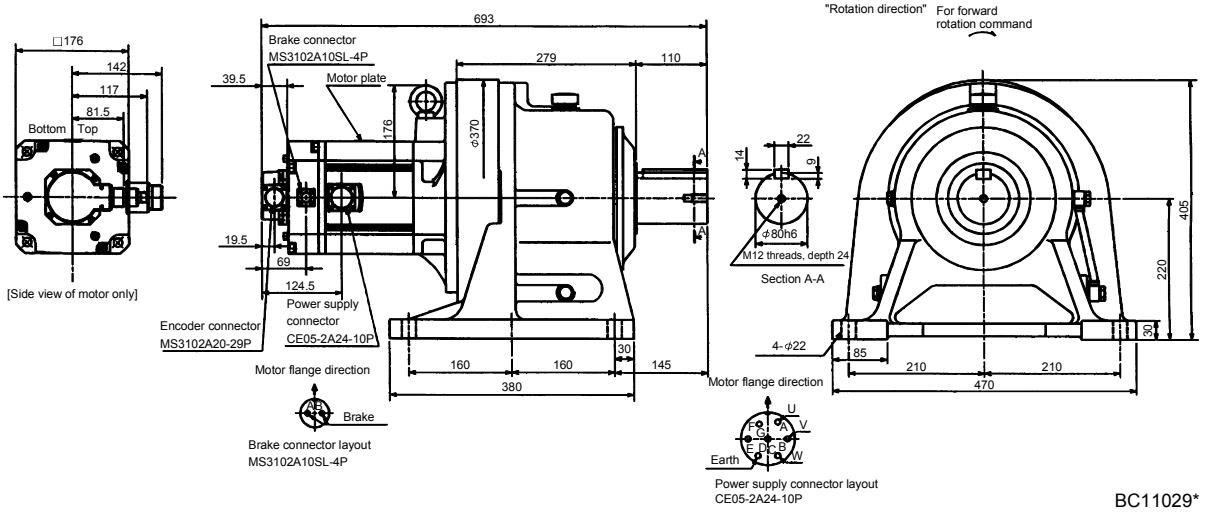


BC11028*
(BC11831*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/29	148.5	177	43.1
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/35	148.0	177	43.1
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/43	147.0	177	43.1

(Note)[Unit: mm]



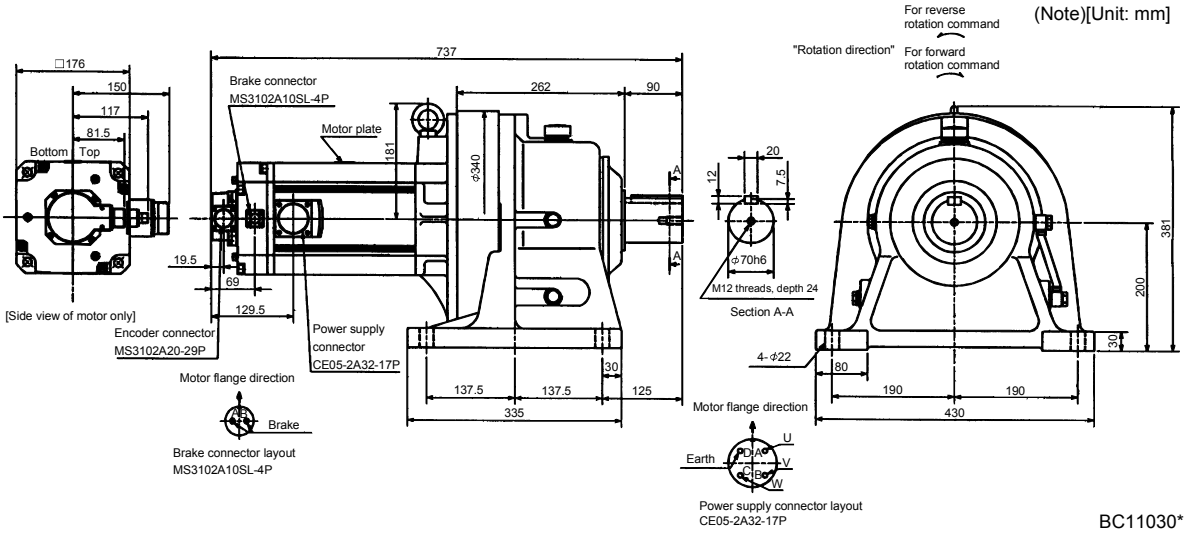
BC11029*
(BC11832*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/11	208.8	144	43.1
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/17	200.0	144	43.1

(Note)[Unit: mm]

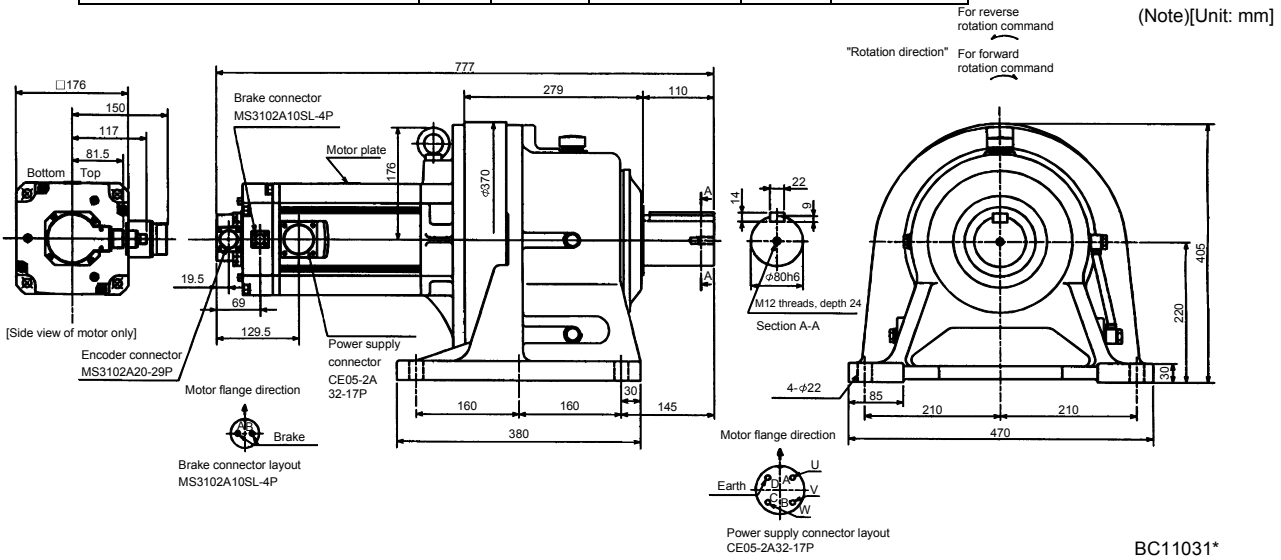


BC11030*
(BC11833*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/29	207.5	186	43.1
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/35	207.0	186	43.1

(Note)[Unit: mm]



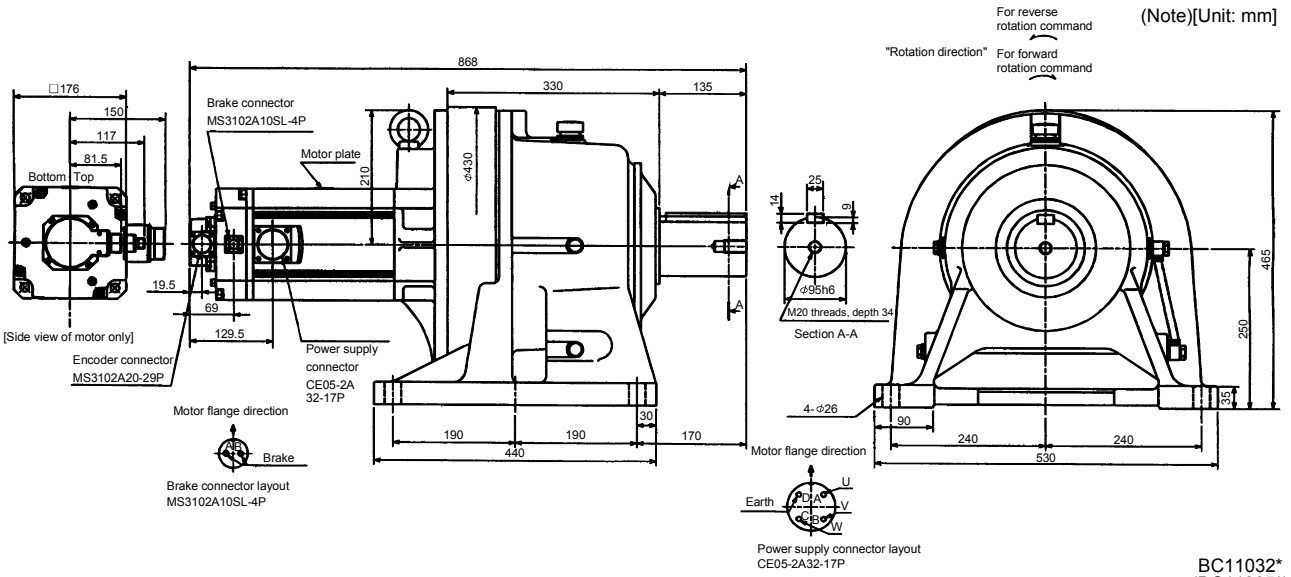
BC11031*
(BC11834*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/43	266.8	267	43.1

(Note)[Unit: mm]



BC11032*
(BC11835*)

Note: The dimensions without tolerances are reference dimensions.

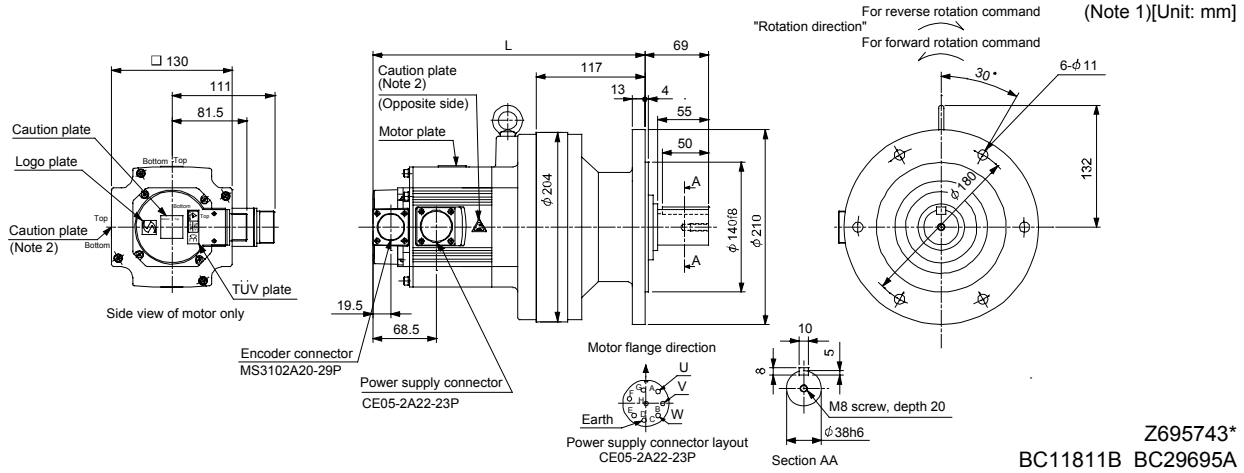
(4) With reduction gear for general industrial machine (flange type)

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/35	7.5	269	27
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/43	7.45	269	27
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/59	7.43	269	27
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/6	16.8	294	29
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/11	15.3	294	29
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/17	14.9	294	29
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/29	14.6	294	29
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/35	14.6	294	29
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/6	23.1	319	31
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/11	21.5	319	31
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/17	21.2	319	31

(Note 1)[Unit: mm]

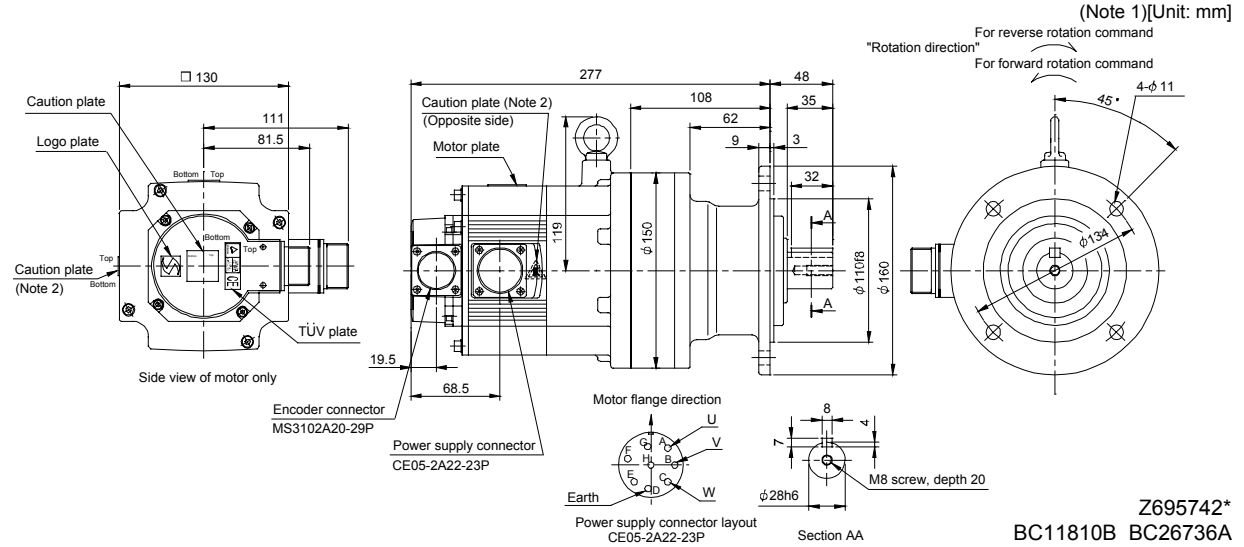


Z695743*
BC11811B BC29695A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/6	7.33	18.5
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/11	6.95	18.5
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/17	6.85	18.5
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/29	6.78	18.5

(Note 1)[Unit: mm]



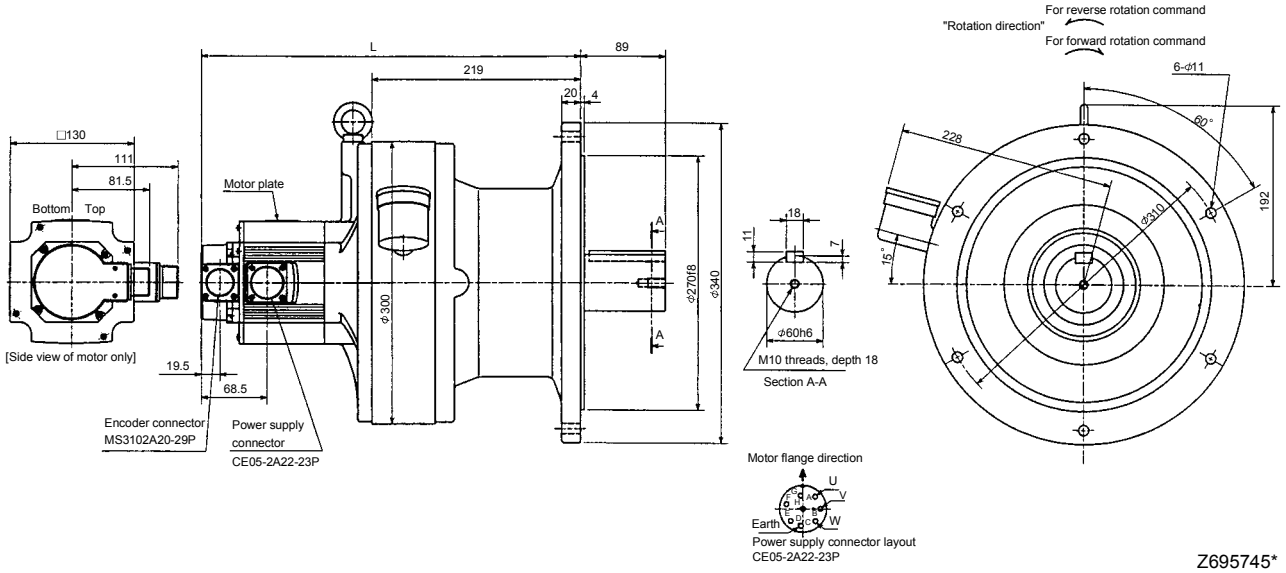
Z695742*
BC11810B BC26736A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF102G1	HC-SFS102G1 HC-SFS1024G1	1.0	1/59	19.5	399	83
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/43	25.8	424	85
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/59	25.7	424	85

(Note)[Unit: mm]

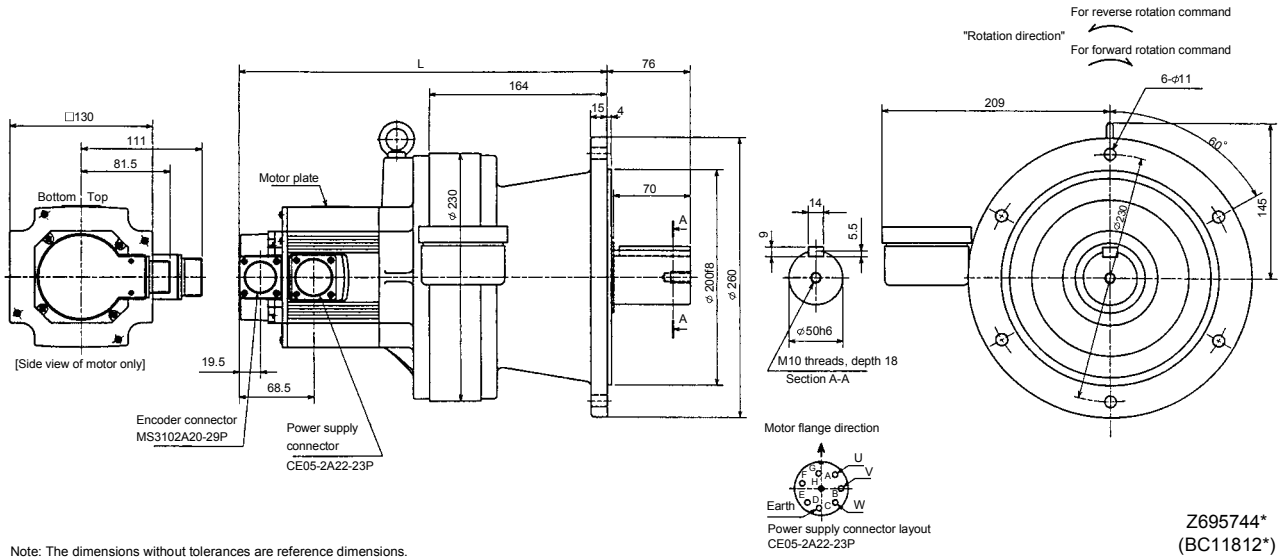


Z695745*
(BC11813*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF102G1	HC-SFS102G1 HC-SFS1024G1	1.0	1/43	15.7	340	48
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/29	22.1	365	50
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/35	22.0	365	50

(Note)[Unit: mm]



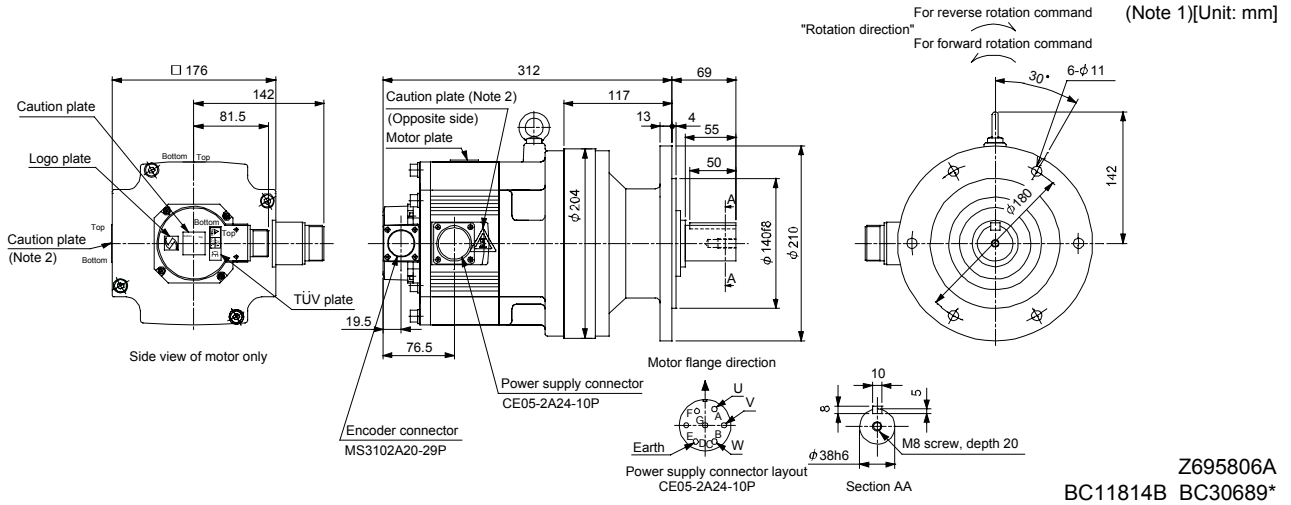
Z695744*
(BC11812*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/6	45.6	34
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/11	44.1	34
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/17	43.7	34

(Note 1)[Unit: mm]

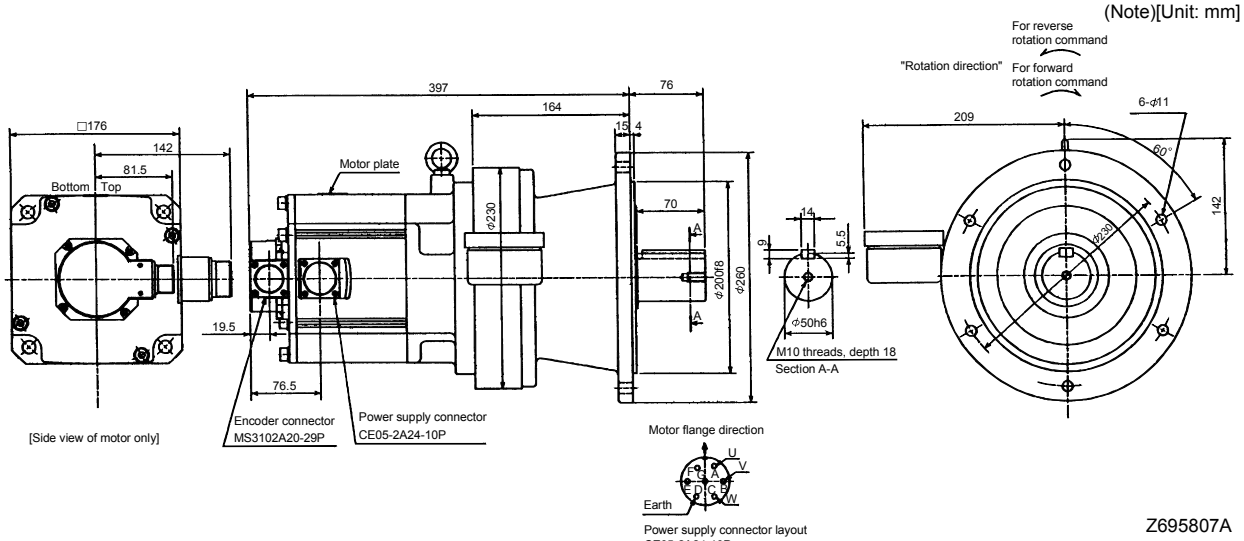


Z695806A
BC11814B BC30689*

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/6	90.1	57
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/11	86.2	57
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/17	85.0	57

(Note)[Unit: mm]



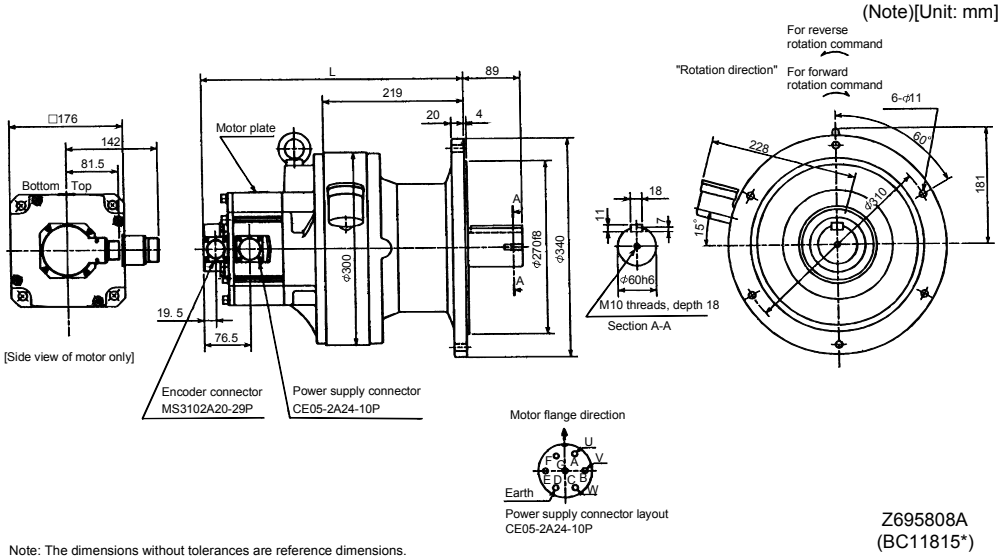
Z695807A
(BC11816*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/29	48.9	409	84
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/35	48.6	409	84
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/43	48.4	409	84
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/59	48.3	409	84
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/29	88.4	451	91
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/35	88.1	451	91

(Note)[Unit: mm]

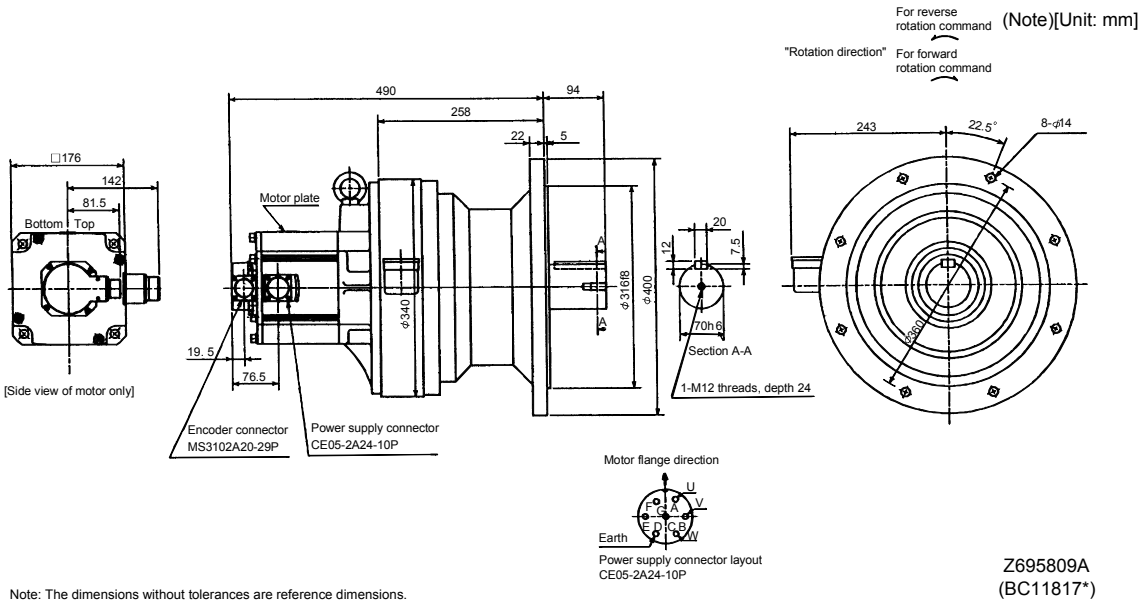


Z695808A
(BC11815*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/43	106.5	133
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/59	105.9	133

(Note)[Unit: mm]

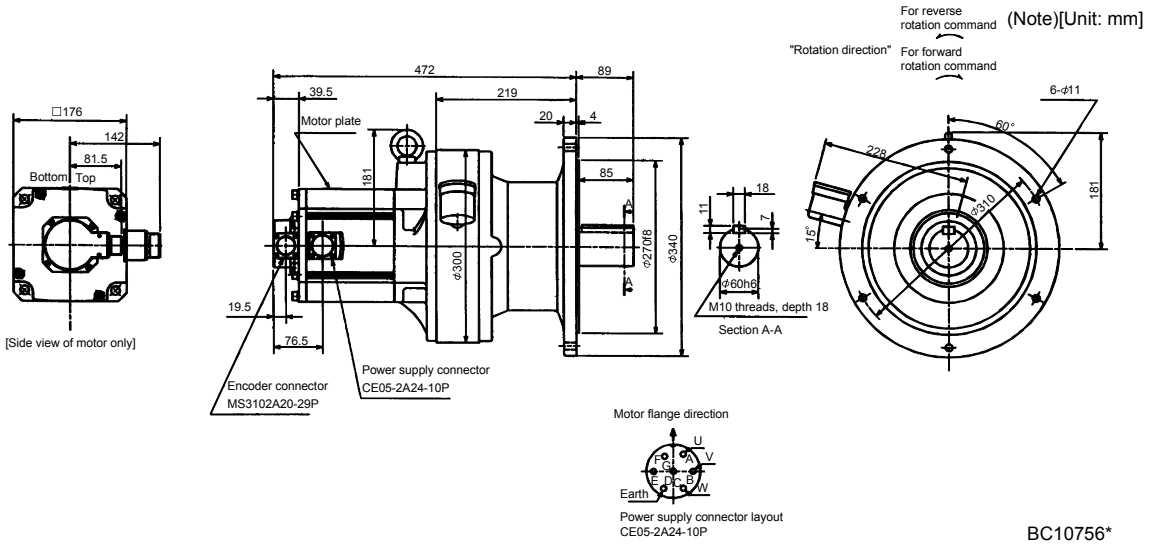


Z695809A
(BC11817*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

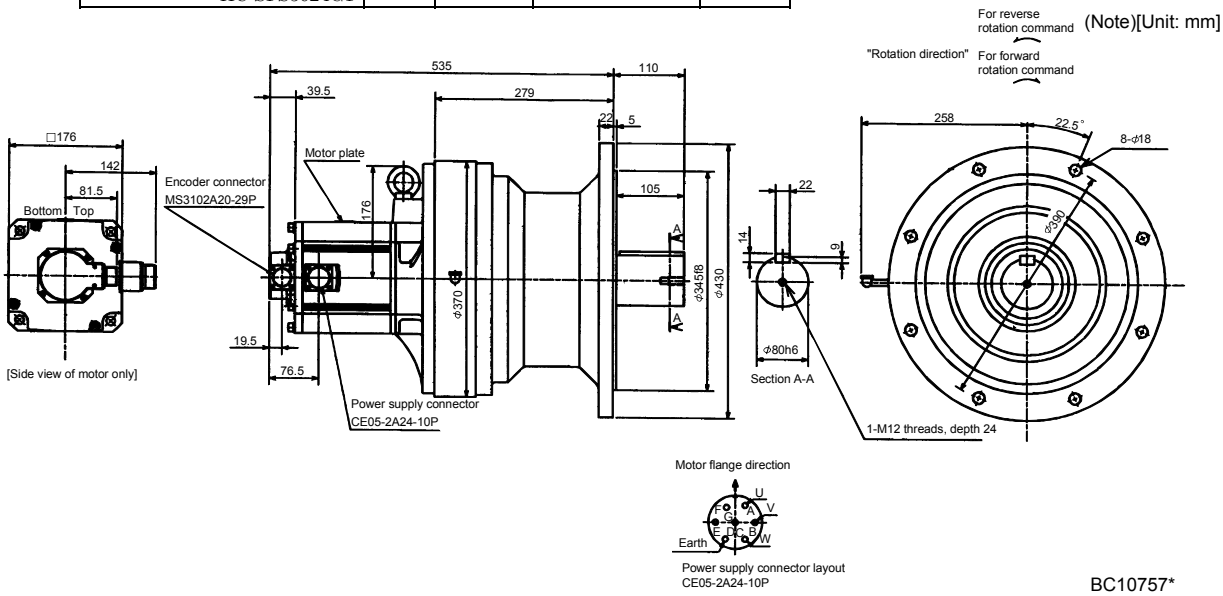
Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/11	113.4	95
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/17	109.4	95



Note: The dimensions without tolerances are reference dimensions.

BC10756*
(BC11818*)

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/29	138.5	162
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/35	138.0	162
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/43	137.0	162

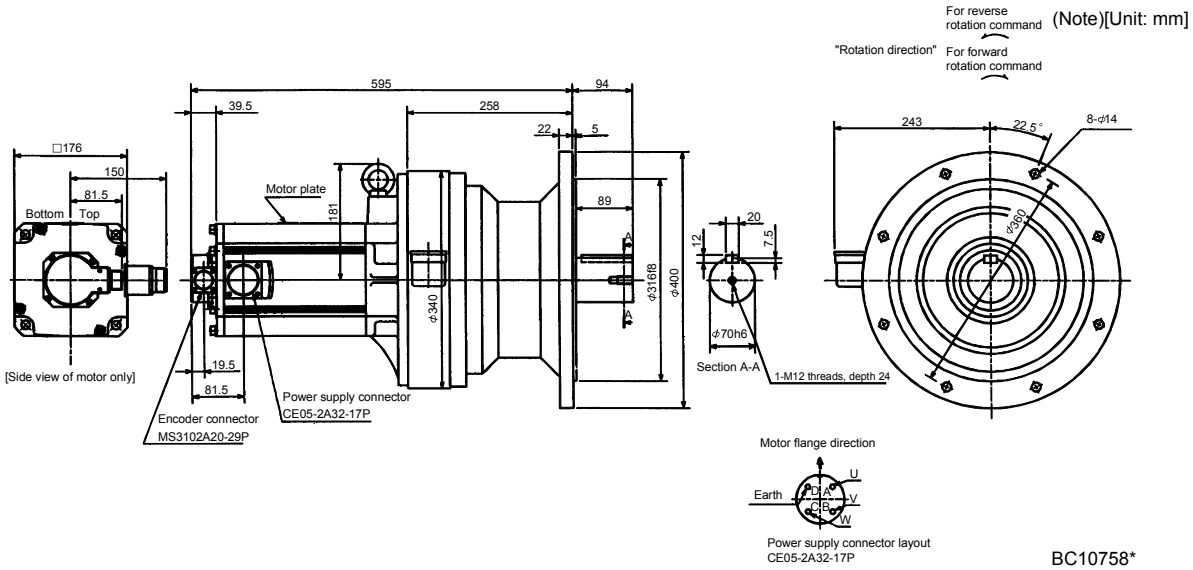


Note: The dimensions without tolerances are reference dimensions.

BC10757*
(BC11819*)

7. OUTLINE DIMENSION DRAWINGS

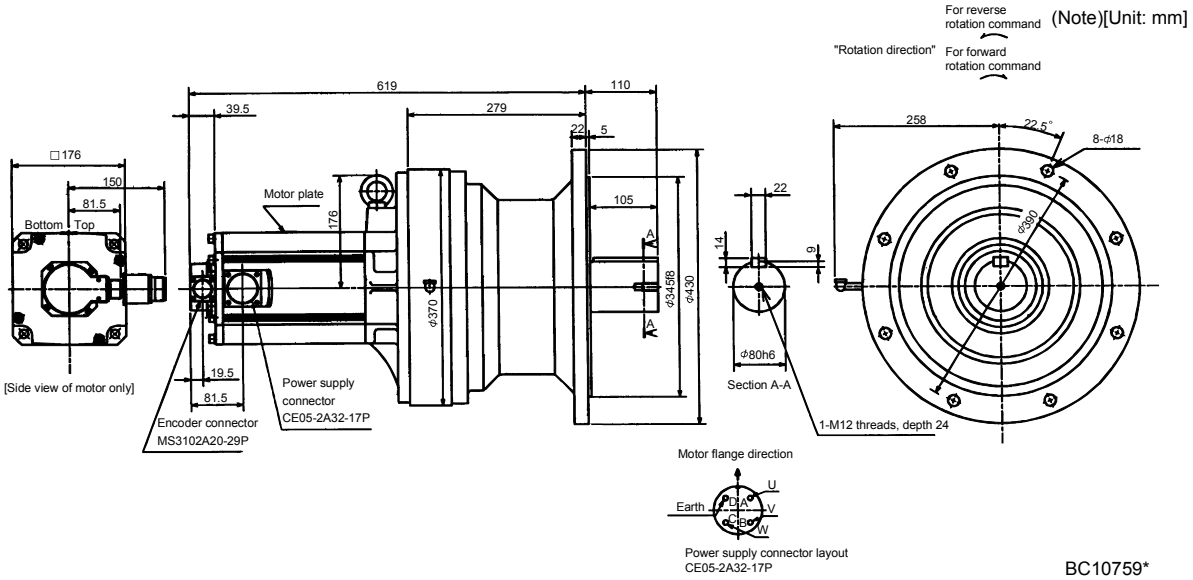
Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/11	198.8	146
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/17	190.0	146



Note: The dimensions without tolerances are reference dimensions.

BC10758*
(BC11820*)

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/29	197.5	171
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/35	197.0	171



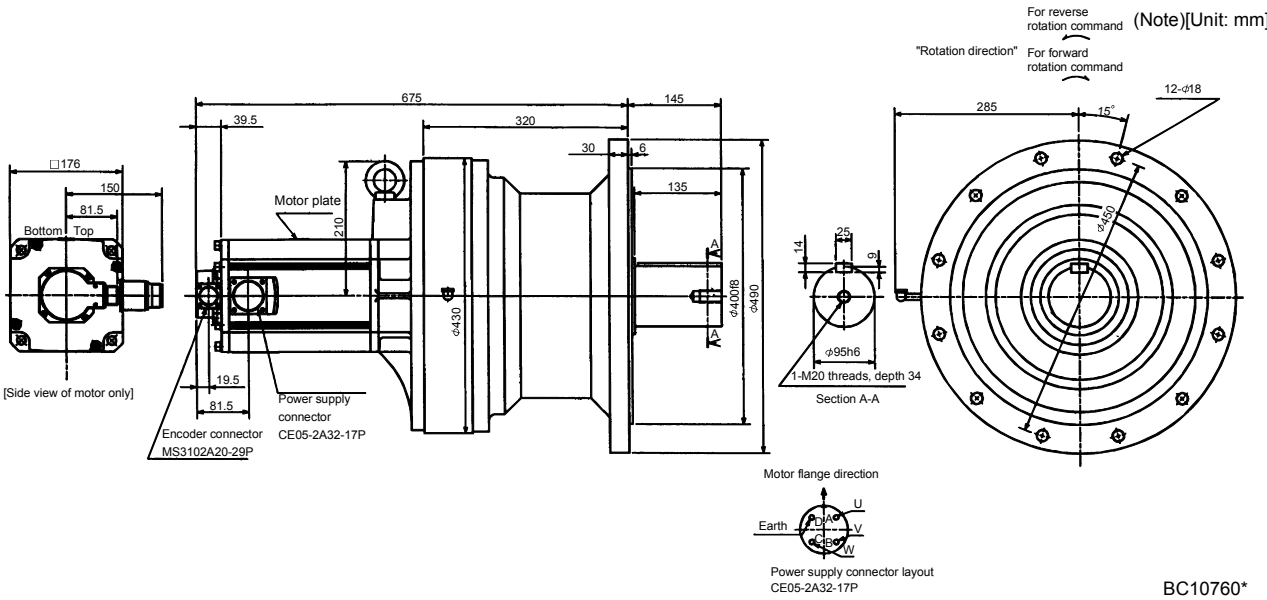
Note: The dimensions without tolerances are reference dimensions.

BC10759*
(BC11821*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/43	256.8	240

(Note)[Unit: mm]



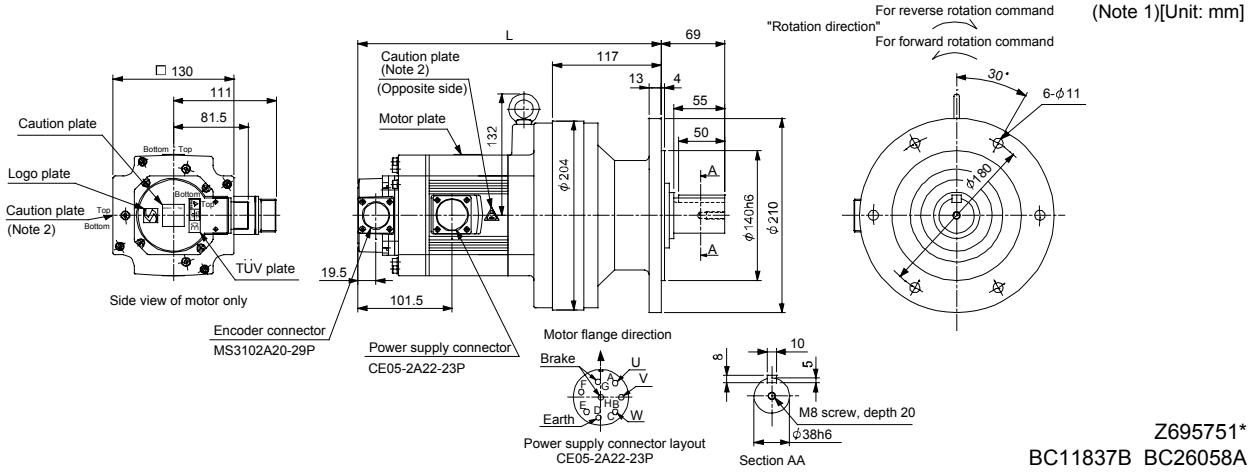
Note: The dimensions without tolerances are reference dimensions.

BC10760*
(BC11822*)

(b) With electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/35	9.2	302	32.5	8.3
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/43	9.15	302	32.5	8.3
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/59	9.13	302	32.5	8.3
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/6	18.5	327	34.5	8.3
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/11	17.0	327	34.5	8.3
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/17	16.6	327	34.5	8.3
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/29	16.3	327	34.5	8.3
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/35	16.28	327	34.5	8.3
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/6	24.8	352	36.5	8.3
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/11	23.2	352	36.5	8.3
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/17	22.9	352	36.5	8.3

(Note 1)[Unit: mm]

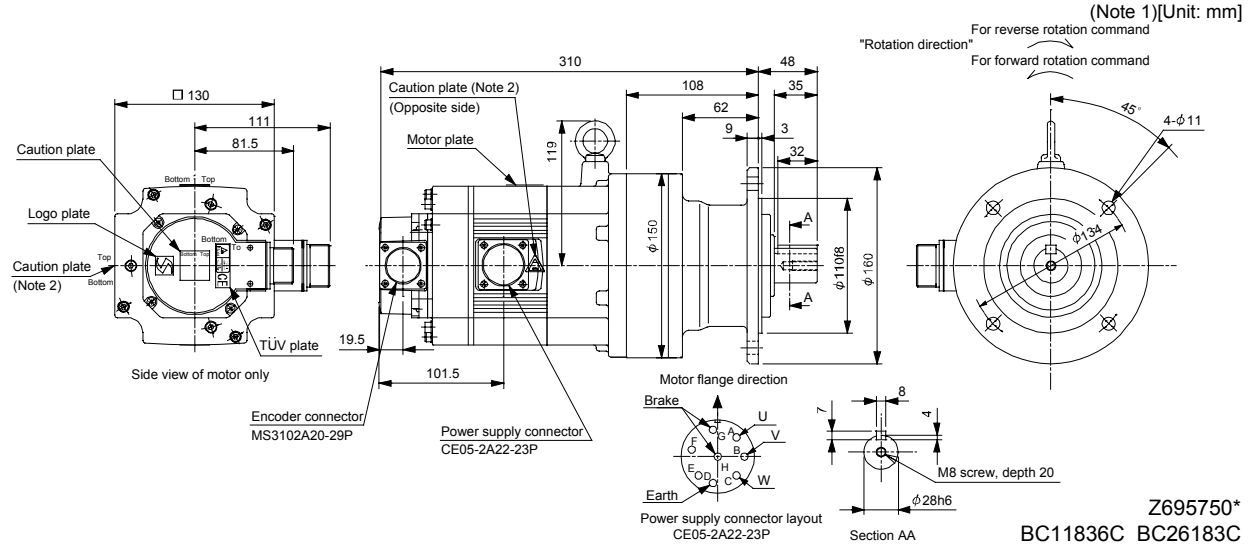


Z695751*
BC11837B BC26058A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/6	9.03	20.5	8.3
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/11	8.65	20.5	8.3
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/17	8.55	20.5	8.3
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/29	8.48	20.5	8.3

(Note 1)[Unit: mm]



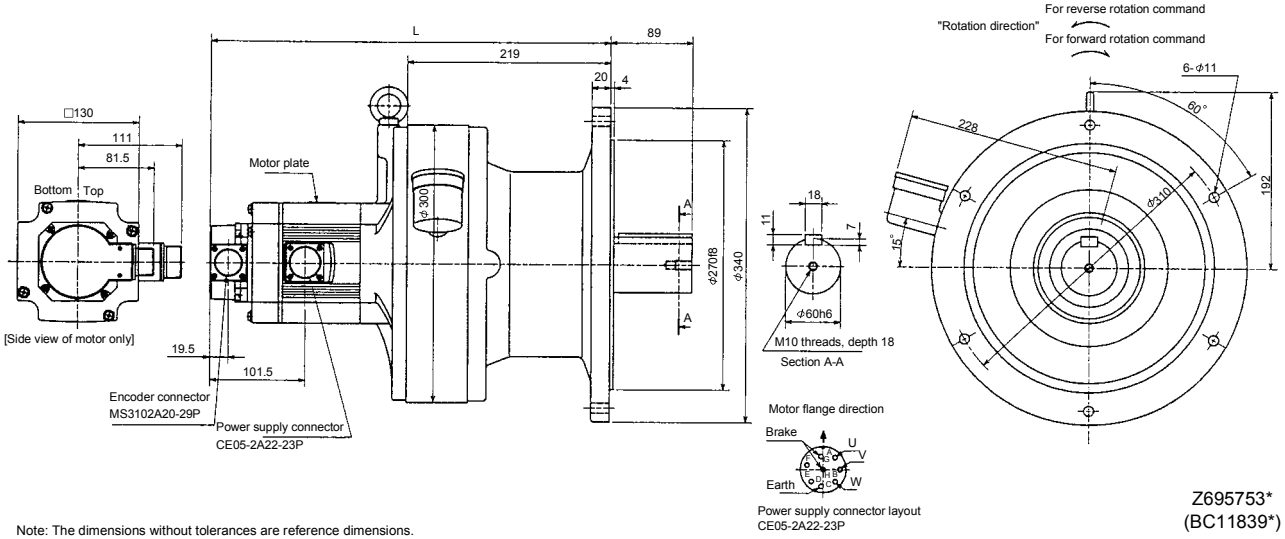
Z695750*
BC11836C BC26183C

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF102BG1	HC-SFS102BG1 HC-SFS1024BG1	1.0	1/59	21.2	432	85	8.3
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/43	27.5	457	87	8.3
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/59	27.4	457	87	8.3

(Note)[Unit: mm]

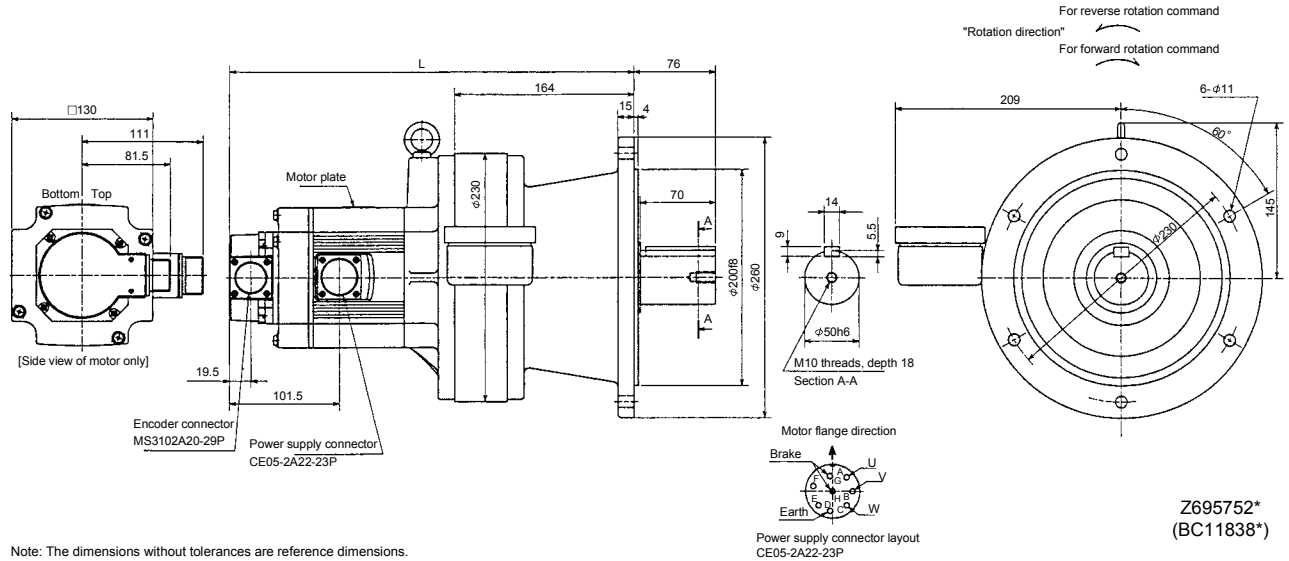


Z695753*
(BC11839*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF102BG1	HC-SFS102BG1 HC-SFS1024BG1	1.0	1/43	17.4	373	50	8.3
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/29	23.8	398	52	8.3
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/35	23.7	398	52	8.3

(Note)[Unit: mm]



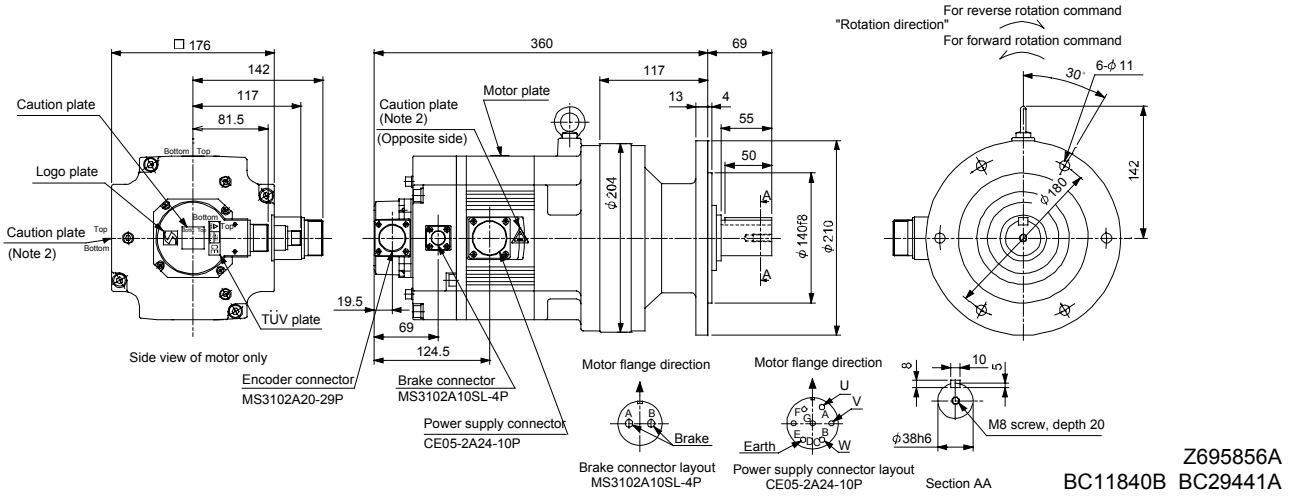
Z695752*
(BC11838*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/6	55.6	40	43.1
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/11	54.1	40	43.1
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/17	53.7	40	43.1

(Note 1)[Unit: mm]

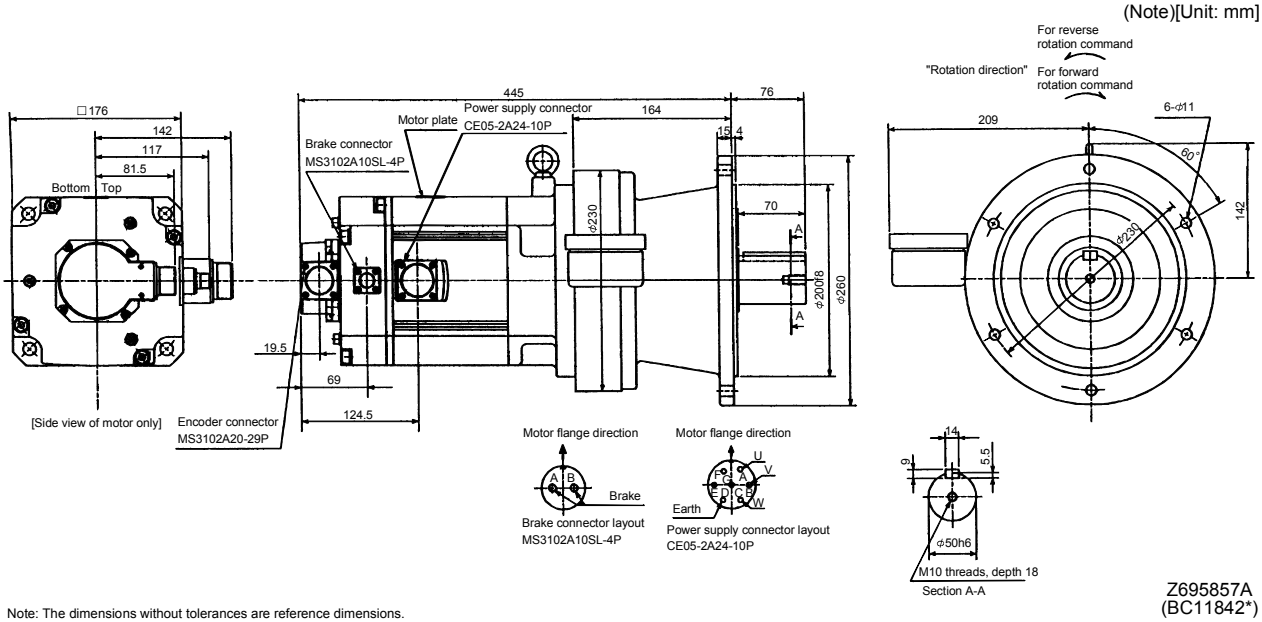


Z695856A
BC11840B BC29441A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/6	100.1	63	43.1
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/11	96.2	63	43.1
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/17	95.0	63	43.1

(Note)[Unit: mm]

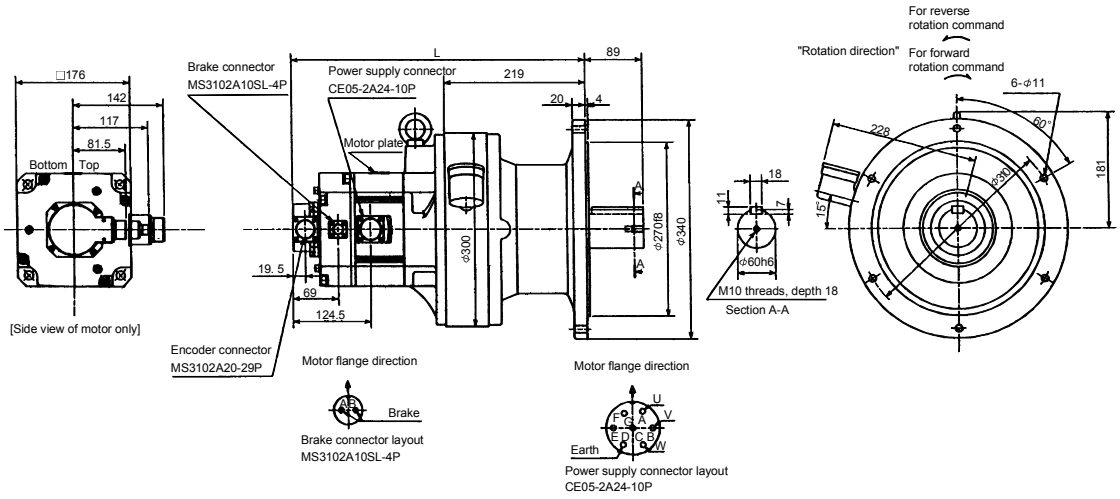


Z695857A
(BC11842*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Mass [kg]	Brake static friction torque [N・m]
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/29	58.9	457	90	43.1
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/35	58.6	457	90	43.1
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/43	58.4	457	90	43.1
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/59	58.3	457	90	43.1
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/29	98.4	499	97	43.1
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/35	98.1	499	97	43.1

(Note)[Unit: mm]

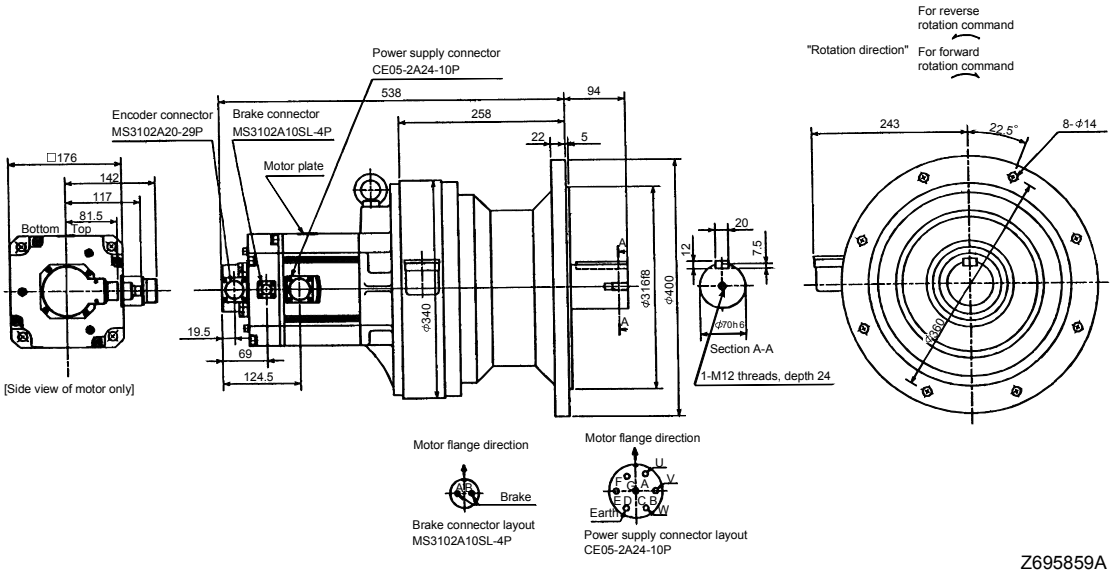


Z695858A
(BC11841*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/43	116.5	139	43.1
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/59	115.9	139	43.1

(Note)[Unit: mm]



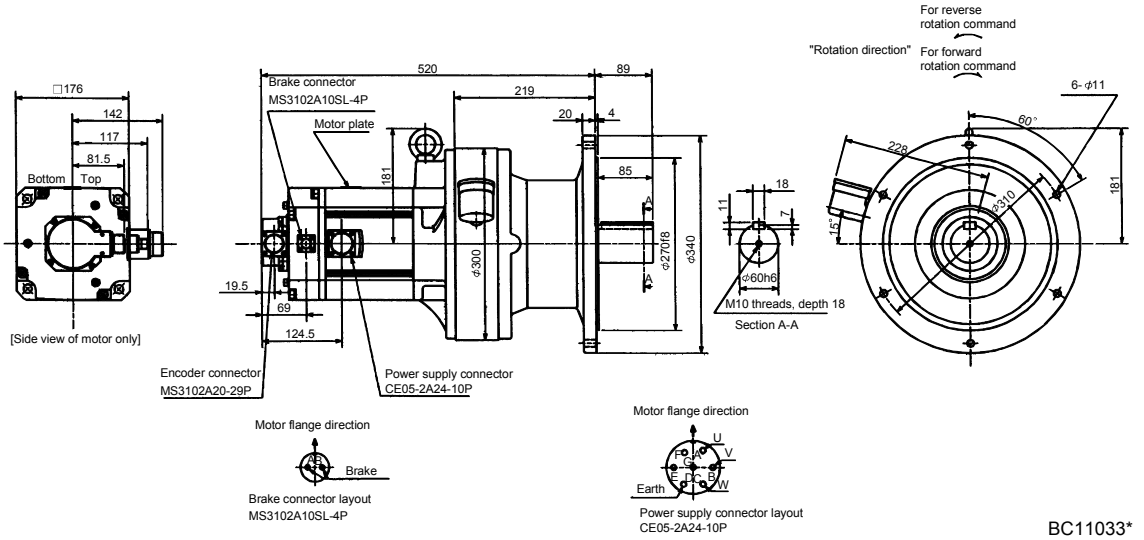
Z695859A
(BC11843*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/11	123.4	101	43.1
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/17	119.4	101	43.1

(Note)[Unit: mm]

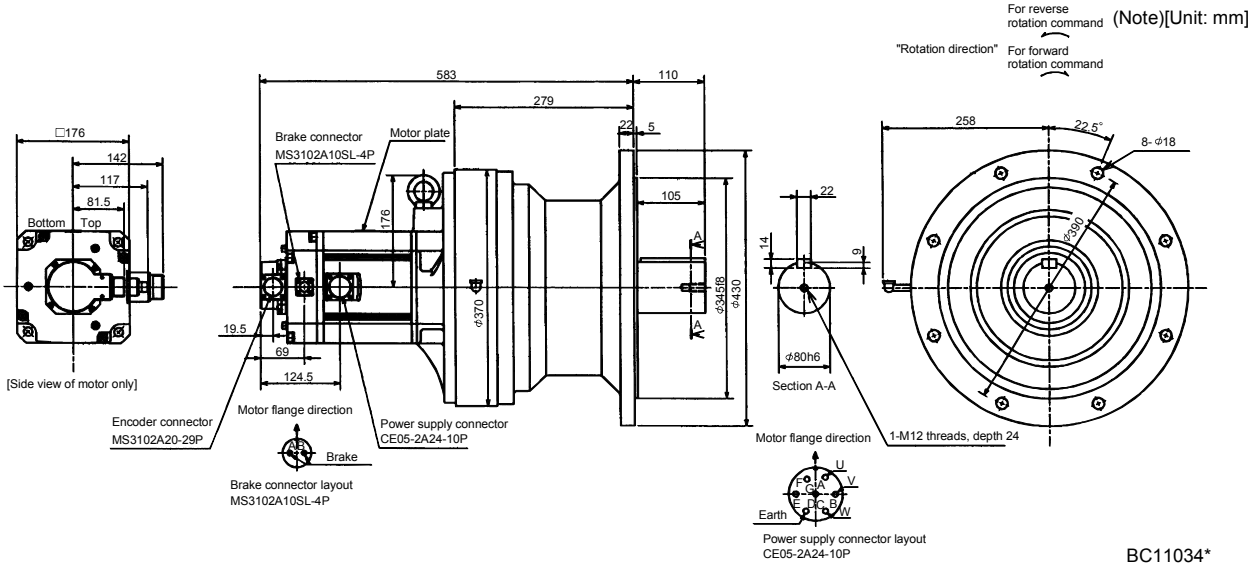


BC11033*
(BC11844*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/29	148.5	168	43.1
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/35	148.0	168	43.1
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/43	147.0	168	43.1

(Note)[Unit: mm]



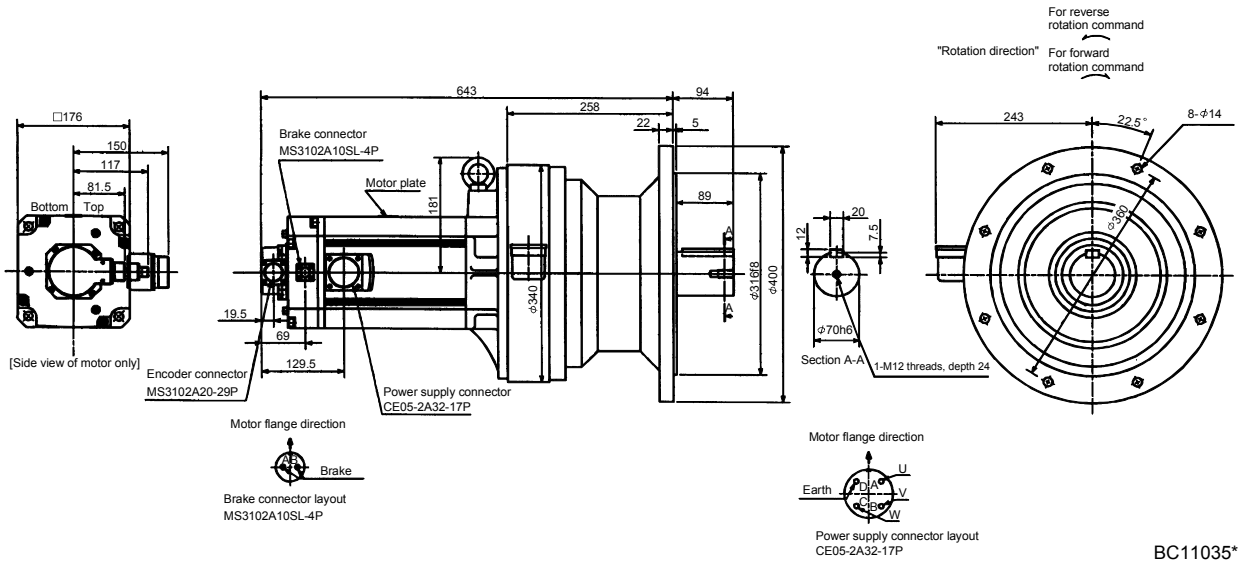
BC11034*
(BC11845*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/11	208.8	152	43.1
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/17	200.0	152	43.1

(Note)[Unit: mm]

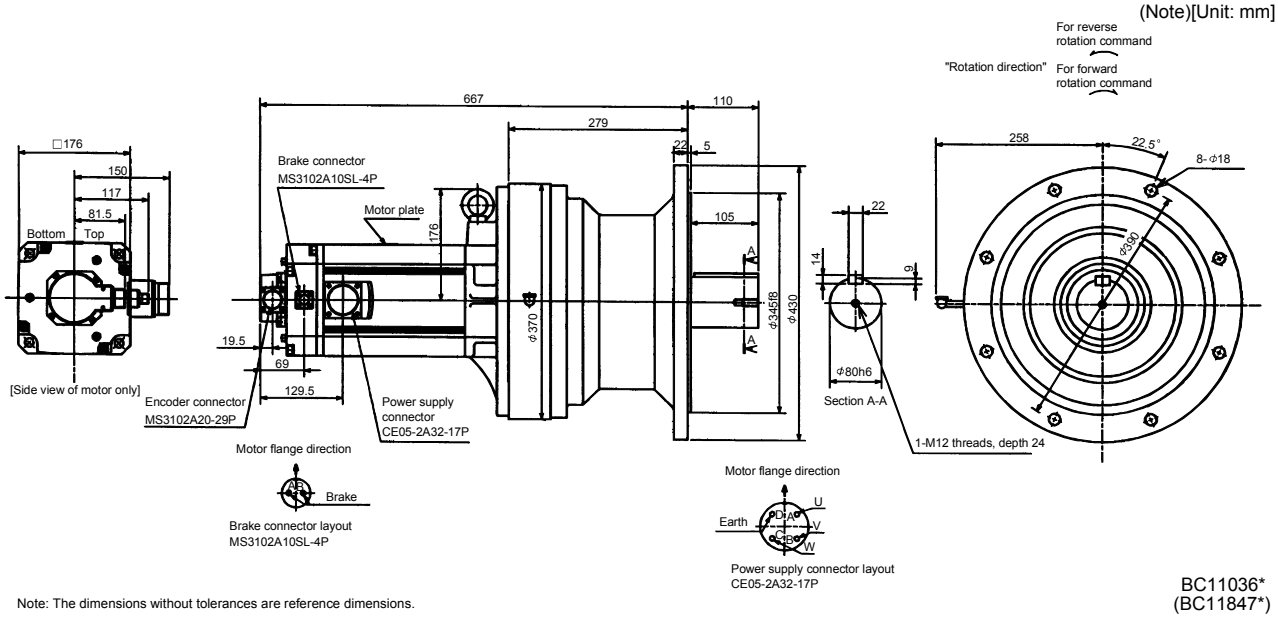


BC11035*
(BC11846*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/29	207.5	177	43.1
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/35	207.0	177	43.1

(Note)[Unit: mm]



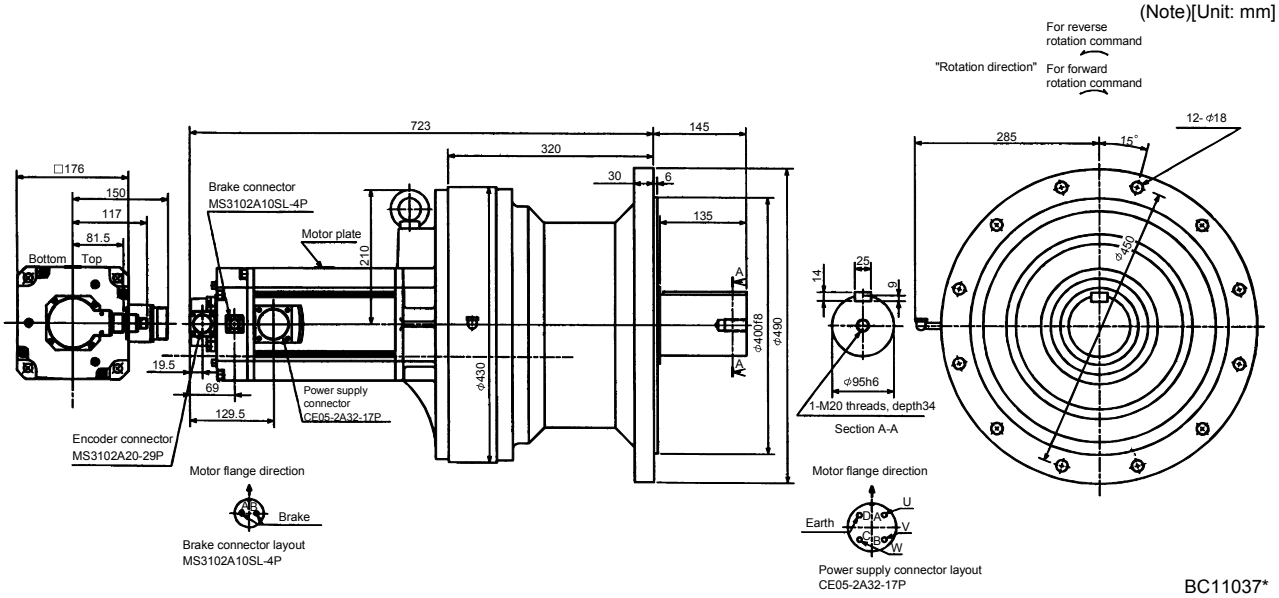
BC11036*
(BC11847*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/43	266.8	246	43.1

(Note)[Unit: mm]



BC11037*
(BC11848*)

Note: The dimensions without tolerances are reference dimensions.

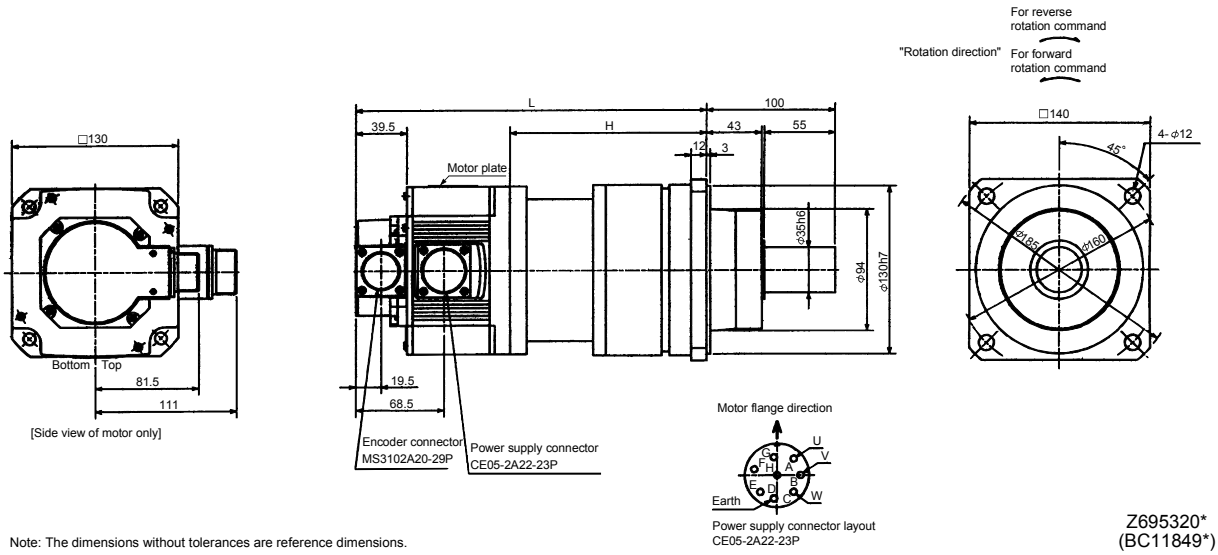
(5) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Variable Dimensions H	Mass [kg]
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-05B-05MEH	1/5	7.9	276	156	13
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-09B-05MEH	1/9	7.55	288	168	13
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-20B-05MEH	1/20	8.03	309	189	15
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL2-05B-10MEH	1/5	15.0	301	156	15
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL2-09B-10MEH	1/9	14.6	313	168	15
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL2-05B-15MEH	1/5	21.2	326	156	17

(Note)[Unit: mm]

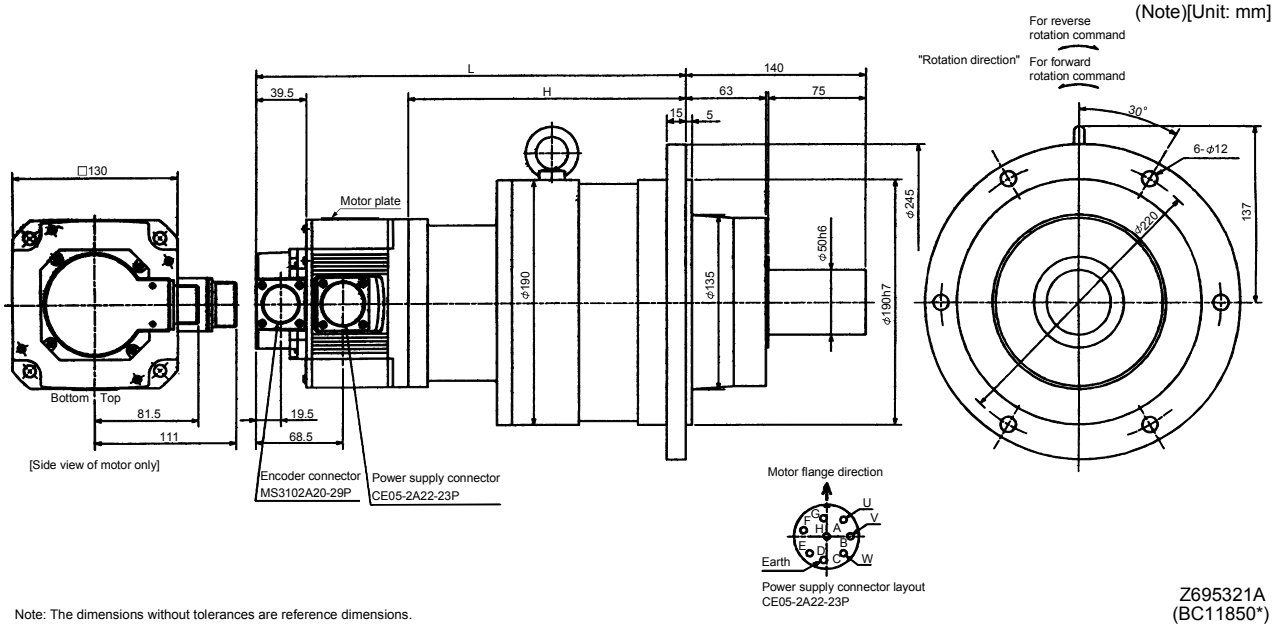


Z695320*
(BC11849*)

Note: The dimensions without tolerances are reference dimensions.

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	Variable Dimensions H	Mass [kg]
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL3-29B-05MEH	1/29	9.4	337	217	30
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL3-45B-05MEH	1/45	8.43	343	223	30
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL3-20B-10MEH	1/20	18.4	362	217	32
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL3-29B-10MEH	1/29	16.5	362	217	32
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL3-09B-15MEH	1/9	24.7	379	209	34
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL3-20B-15MEH	1/20	24.6	387	217	34

(Note)[Unit: mm]



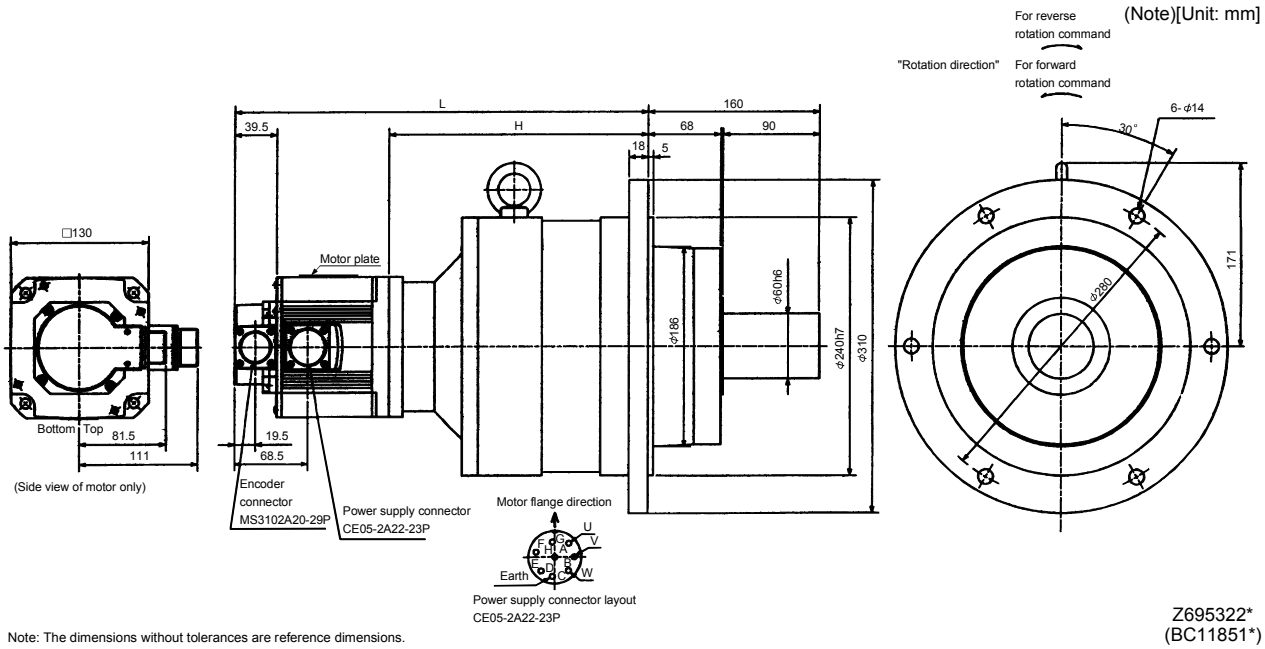
Z695321A
(BC11850*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Mass [kg]
						L	H	
HC-SF102G2	HC-SFS102G2 HC-SFS1024G2	1.0	BL4-45B-10MEH	1/45	20.3	389	244	52
HC-SF152G2	HC-SFS152G2 HC-SFS1524G2	1.5	BL4-29B-15MEH	1/29	30.3	411	241	54
HC-SF152G2	HC-SFS152G2 HC-SFS1524G2	1.5	BL4-45B-15MEH	1/45	26.5	414	244	54

(Note)[Unit: mm]

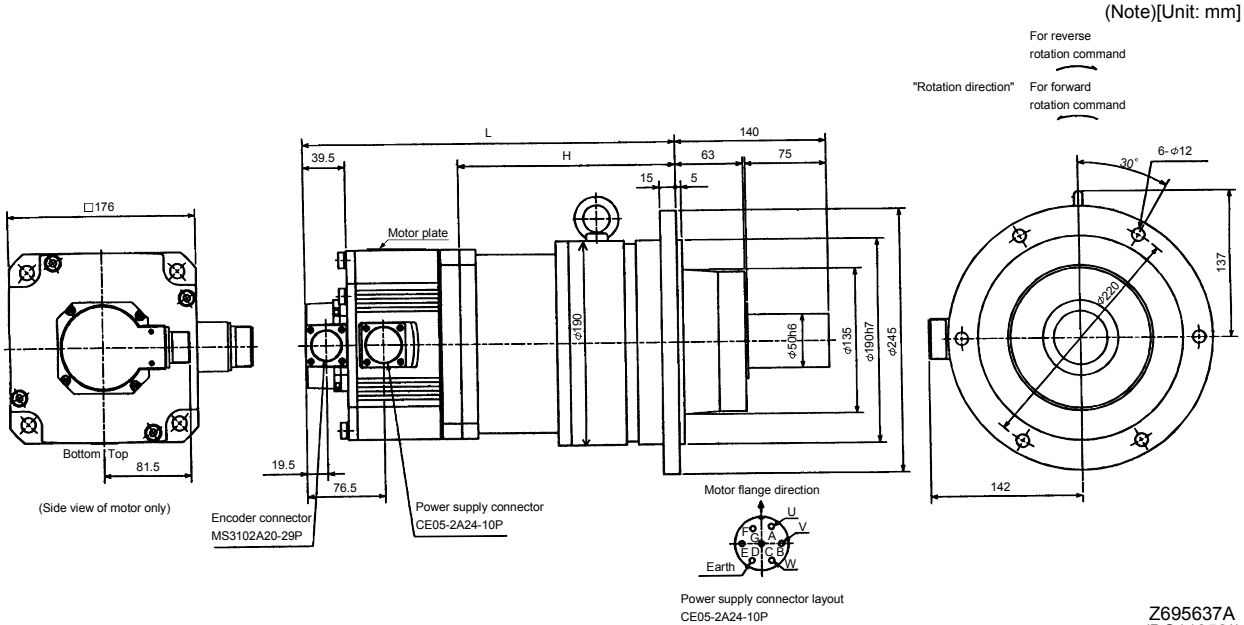


Z695322*
(BC11851*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Mass [kg]
						L	H	
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL3-05B-20MEH	1/5	49.6	348	203	30
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL3-09B-20MEH	1/9	47.2	375	230	37

(Note)[Unit: mm]



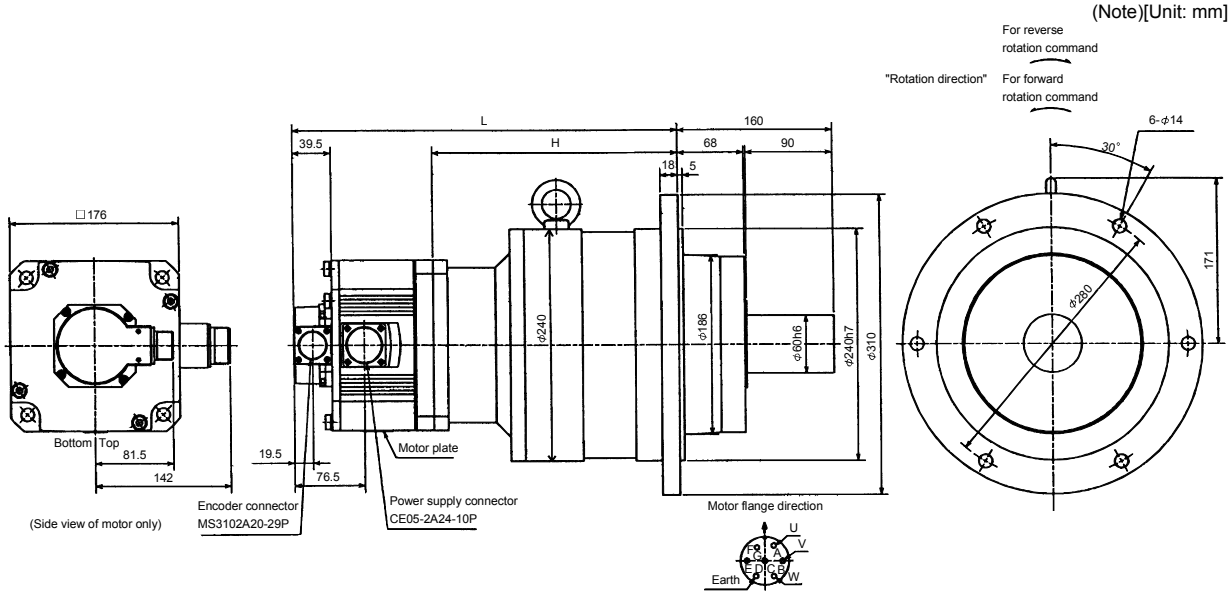
Z695637A
(BC11852*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
						L	H		
HC-SF202G2	HC-SFS202G2	HC-SFS2024G2	2.0	BL4-20B-20MEH	1/20	407	262	59.6	57
HC-SF202G2	HC-SFS202G2	HC-SFS2024G2	2.0	BL4-29B-20MEH	1/29	407	262	52.8	57
HC-SF202G2	HC-SFS202G2	HC-SFS2024G2	2.0	BL4-45B-20MEH	1/45	410	265	49.1	57
HC-SF352G2	HC-SFS352G2	HC-SFS3524G2	3.5	BL4-05B-35MEH	1/5	410	223	99.4	54
HC-SF352G2	HC-SFS352G2	HC-SFS3524G2	3.5	BL4-09B-35MEH	1/9	442	255	91.5	64
HC-SF352G2	HC-SFS352G2	HC-SFS3524G2	3.5	BL4-20B-35MEH	1/20	449	262	99.1	64

(Note)[Unit: mm]

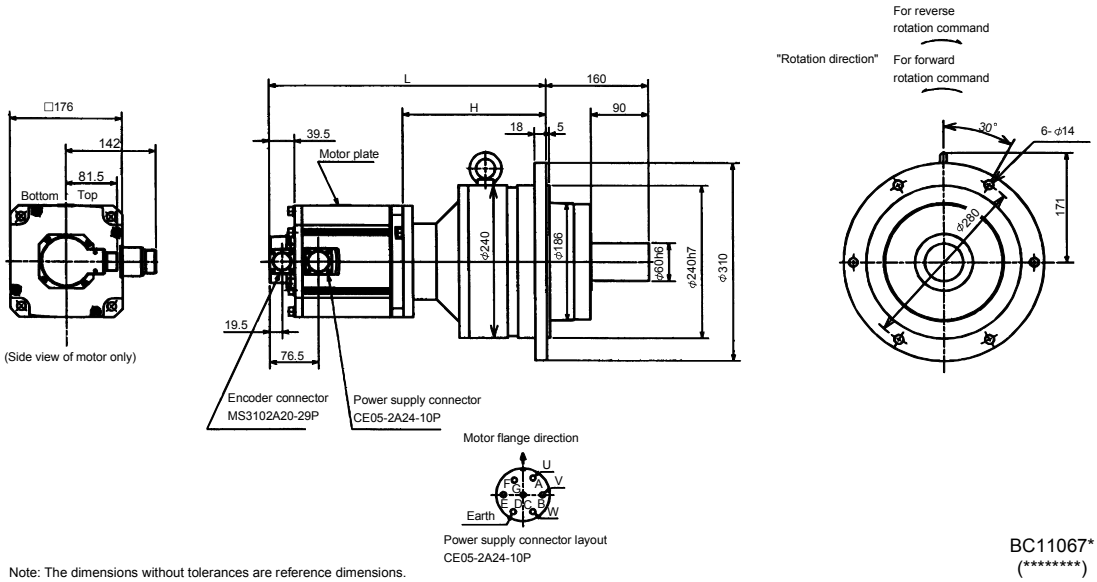


Note: The dimensions without tolerances are reference dimensions.

Z695638A
(BC11853*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
					L	H		
HC-SF502G2	HC-SFS502G2 HC-SFS5024G2	5.0	BL4-05B-50MEH	1/5	431	223	118.4	58
HC-SF502G2	HC-SFS502G2 HC-SFS5024G2	5.0	BL4-09B-50MEH	1/9	463	255	110.5	68

(Note)[Unit: mm]

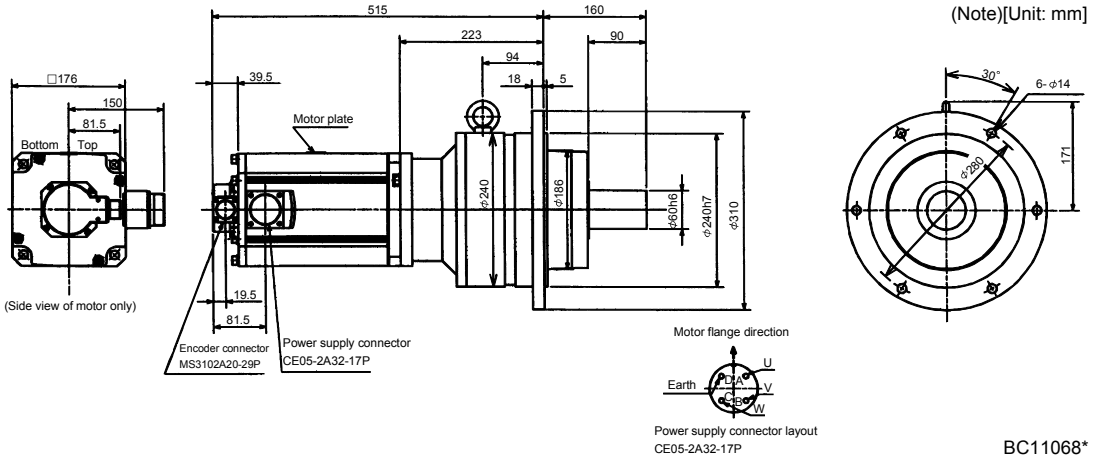


Note: The dimensions without tolerances are reference dimensions.

BC11067*
(********)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-SF702G2	HC-SFS702G2 HC-SFS7024G2	7.0	BL4-05B-70MEH	1/5	177.4	67

(Note)[Unit: mm]



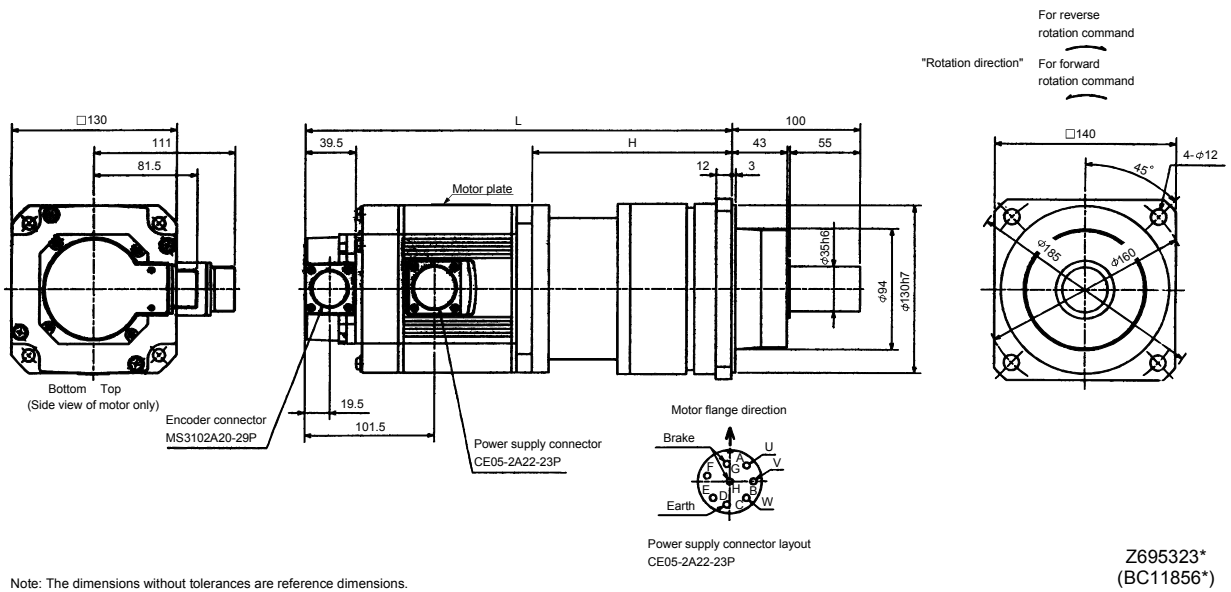
BC11068*
(********)

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
						L	H		
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-05B-05MEH	1/5	9.6	309	156	8.5	15
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-09B-05MEH	1/9	9.25	321	168	8.5	15
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-20B-05MEH	1/20	9.73	342	189	8.5	17
HC-SF102BG2	HC-SFS102BG2 HC-SFS1024BG2	1.0	BL2-05B-10MEH	1/5	16.7	334	156	8.5	17
HC-SF102BG2	HC-SFS102BG2 HC-SFS1024BG2	1.0	BL2-09B-10MEH	1/9	16.3	346	168	8.5	17
HC-SF152BG2	HC-SFS152BG2 HC-SFS1524BG2	1.5	BL2-05B-15MEH	1/5	22.9	359	156	8.5	19

(Note)[Unit: mm]



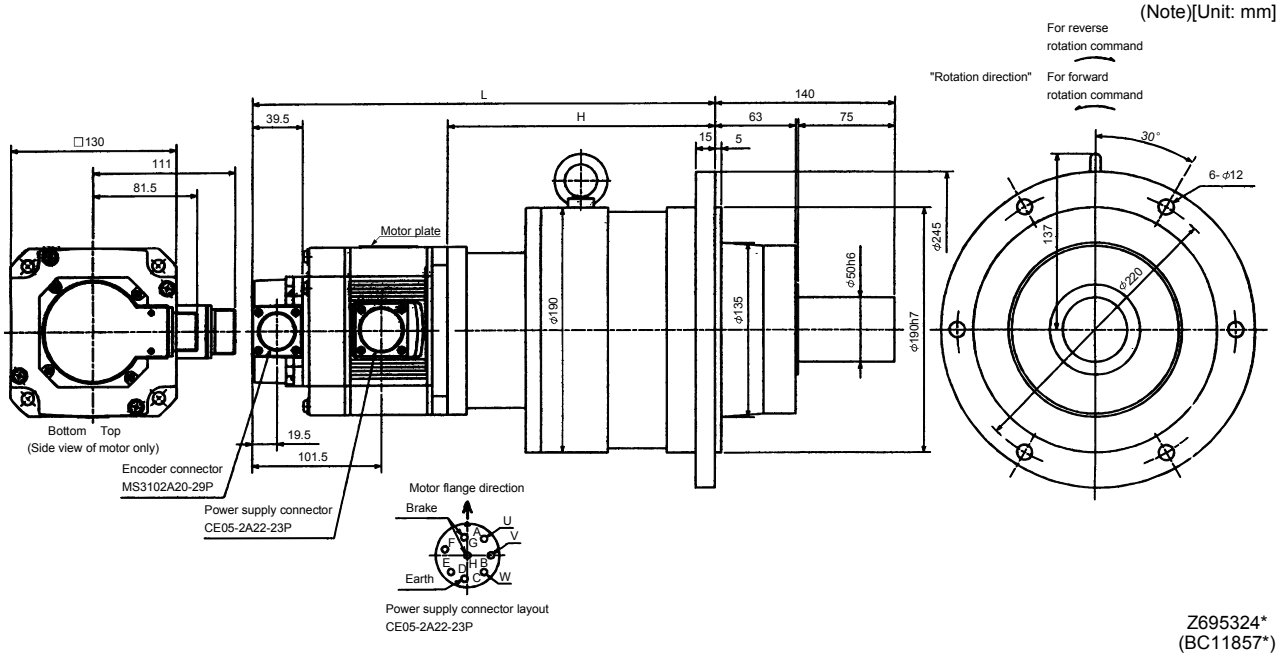
Z695323*
(BC11856*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10⁻⁴kg・m²]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
							L	H		
HC-SF52BG2	HC-SFS52BG2	HC-SFS524BG2	0.5	BL3-29B-05MEH	1/29	11.1	370	217	8.5	32
HC-SF52BG2	HC-SFS52BG2	HC-SFS524BG2	0.5	BL3-45B-05MEH	1/45	10.1	376	223	8.5	32
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL3-20B-10MEH	1/20	20.1	395	217	8.5	34
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL3-29B-10MEH	1/29	18.2	395	217	8.5	34
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL3-09B-15MEH	1/9	26.4	412	209	8.5	36
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL3-20B-15MEH	1/20	26.3	420	217	8.5	36

(Note)[Unit: mm]

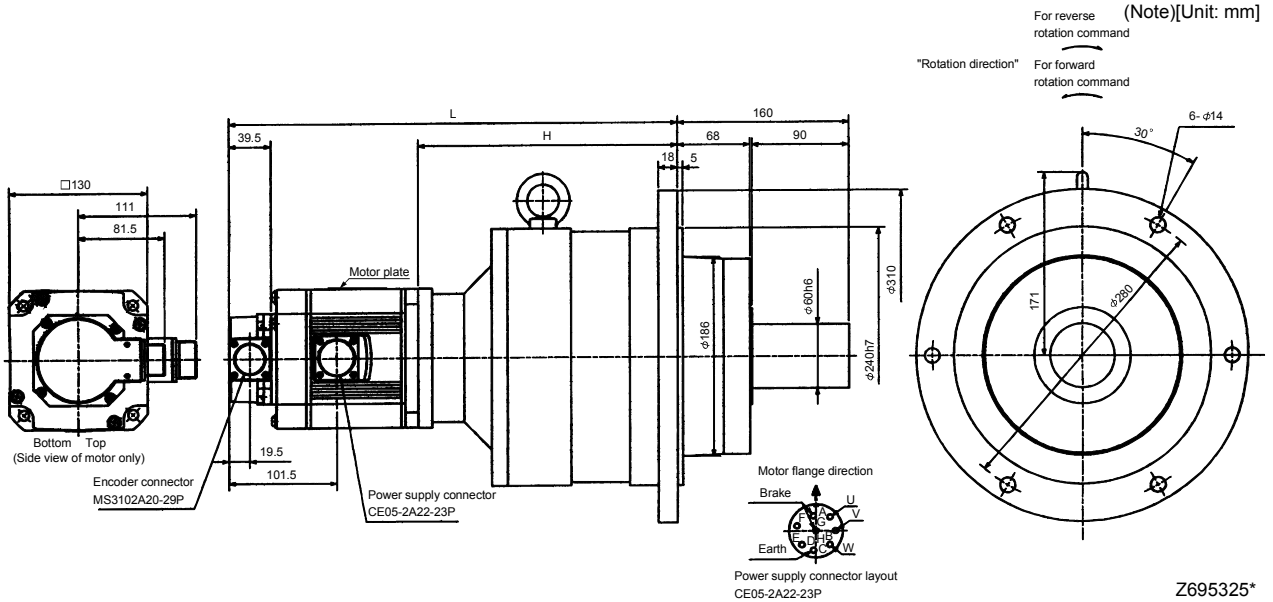


Z695324*
(BC11857*)

Note: The dimensions without tolerances are reference dimensions.

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10⁻⁴kg・m²]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
							L	H		
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL4-45B-10MEH	1/45	22.0	422	244	8.5	54
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL4-29B-15MEH	1/29	32.0	444	241	8.5	56
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL4-45B-15MEH	1/45	28.2	447	244	8.5	56

(Note)[Unit: mm]



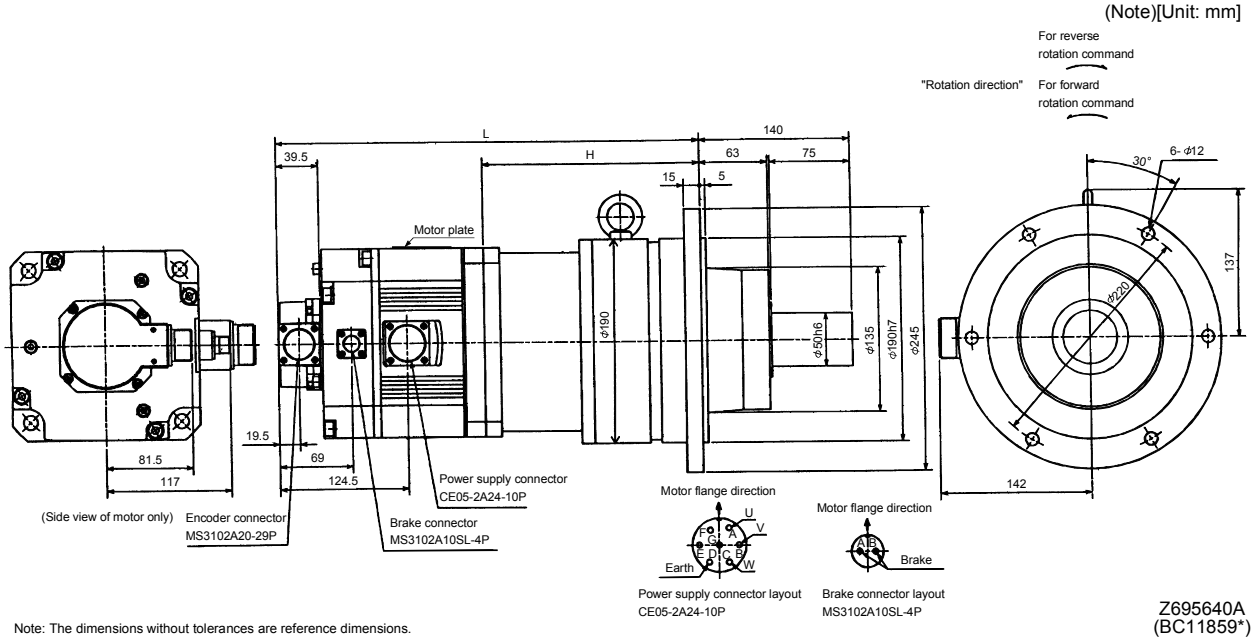
Z695325*
(BC11858*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions L	Variable Dimensions H	Brake static friction torque [N・m]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HC-SF202BG2 HC-SFS202BG2 HC-SFS2024BG2	2.0	BL3-05B-20MEH	1/5	396	203	43.1	59.6	36
HC-SF202BG2 HC-SFS202BG2 HC-SFS2024BG2	2.0	BL3-09B-20MEH	1/9	423	230	43.1	57.2	43

(Note)[Unit: mm]

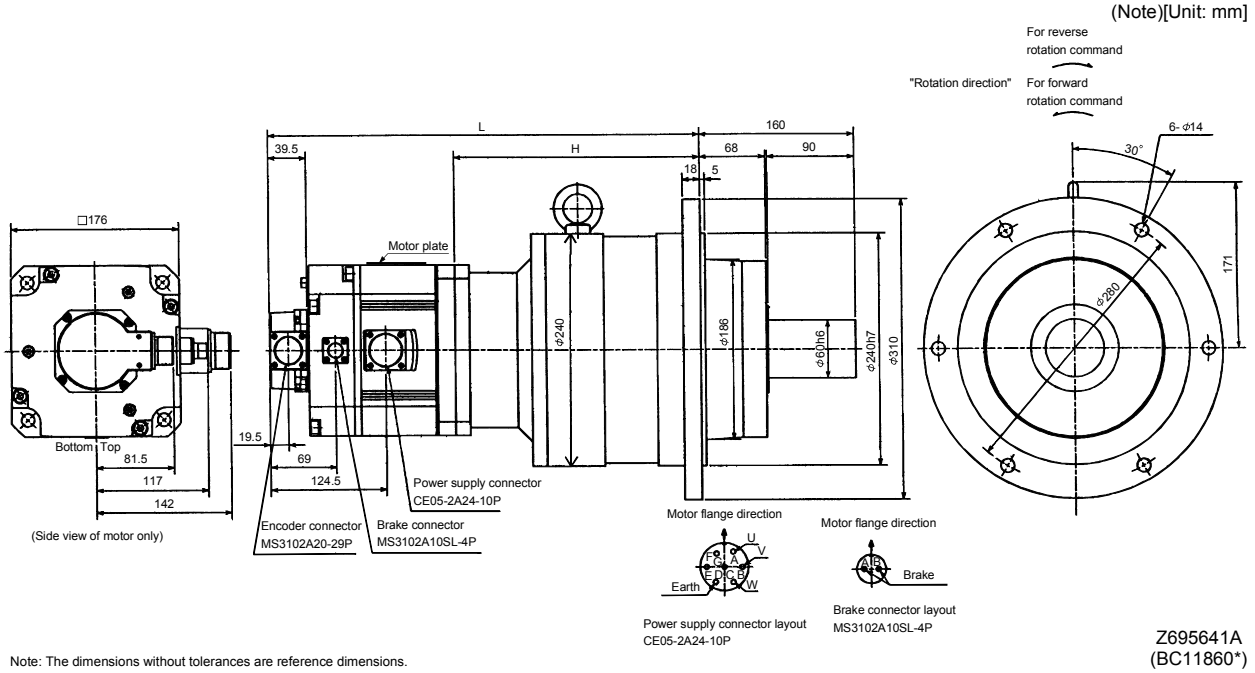


Note: The dimensions without tolerances are reference dimensions.

Z695640A
(BC11859*)

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions L	Variable Dimensions H	Brake static friction torque [N・m]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HC-SF202BG2 HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-20B-20MEH	1/20	455	262	43.1	69.6	63
HC-SF202BG2 HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-29B-20MEH	1/29	455	262	43.1	62.8	63
HC-SF202BG2 HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-45B-20MEH	1/45	458	265	43.1	59.1	63
HC-SF352BG2 HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-05B-35MEH	1/5	458	223	43.1	109.4	60
HC-SF352BG2 HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-09B-35MEH	1/9	490	255	43.1	101.5	70
HC-SF352BG2 HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-20B-35MEH	1/20	497	262	43.1	109.1	70

(Note)[Unit: mm]



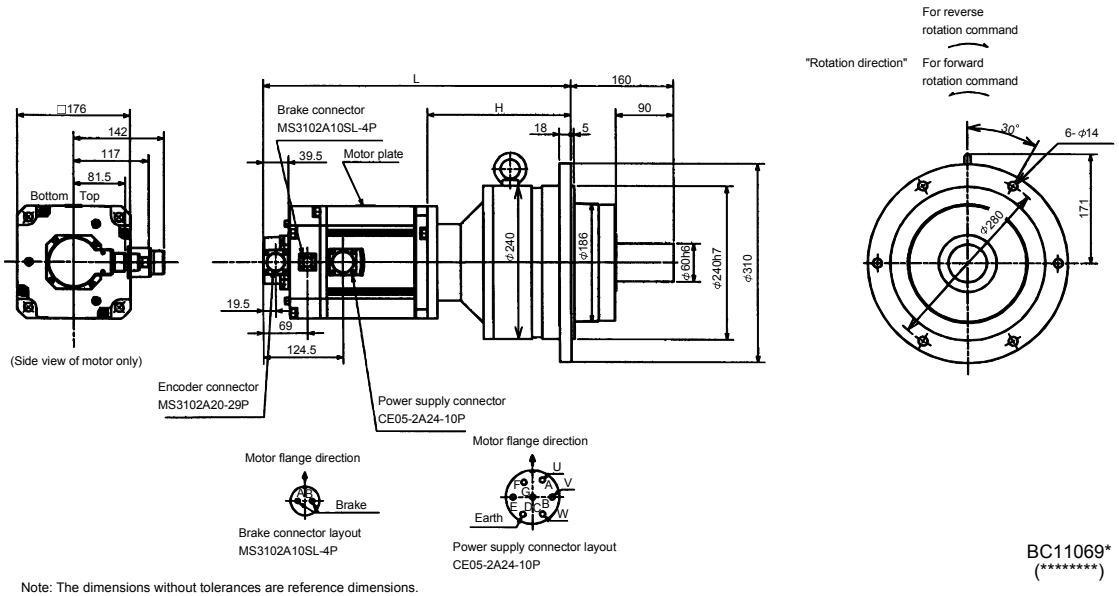
Note: The dimensions without tolerances are reference dimensions.

Z695641A
(BC11860*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
					L	H			
HC-SF502BG2	HC-SFS502BG2 HC-SFS5024BG2	5.0	BL4-05B-50MEH	1/5	479	223	128.4	64	43.1
HC-SF502BG2	HC-SFS502BG2 HC-SFS5024BG2	5.0	BL4-09B-50MEH	1/9	511	255	120.5	74	43.1

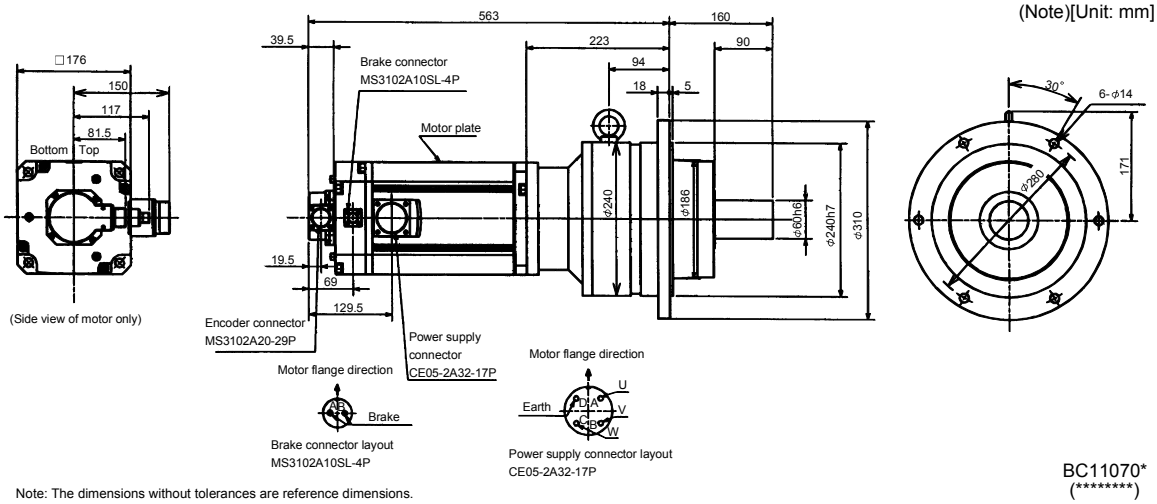
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-SF702BG2	HC-SFS702BG2 HC-SFS7024BG2	7.0	BL4-05B-70MEH	1/5	187.4	73	43.1

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

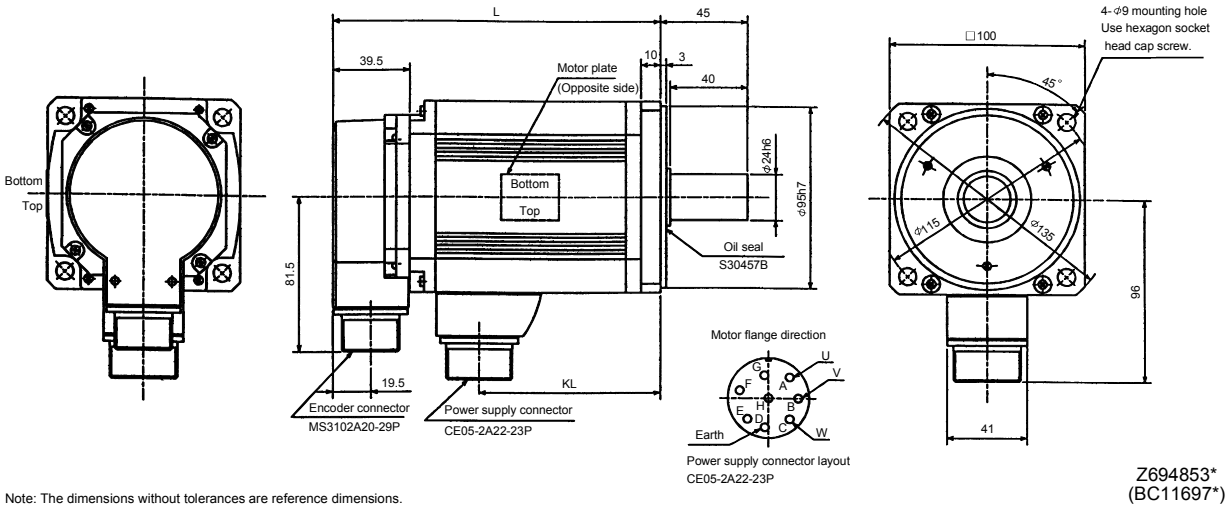
7.1.4 HC-RF・HC-RFS series

If the above indicated value is exceeded, please consult us.

(1) Standard (without electromagnetic brake, without reduction gear)

Model		Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Mass [kg]
				L	KL	
HC-RF103	HC-RFS103	1.0	1.5	147	71	3.9
HC-RF153	HC-RFS153	1.5	1.9	172	96	5.0
HC-RF203	HC-RFS203	2.0	2.3	197	121	6.2

(Note)[Unit: mm]

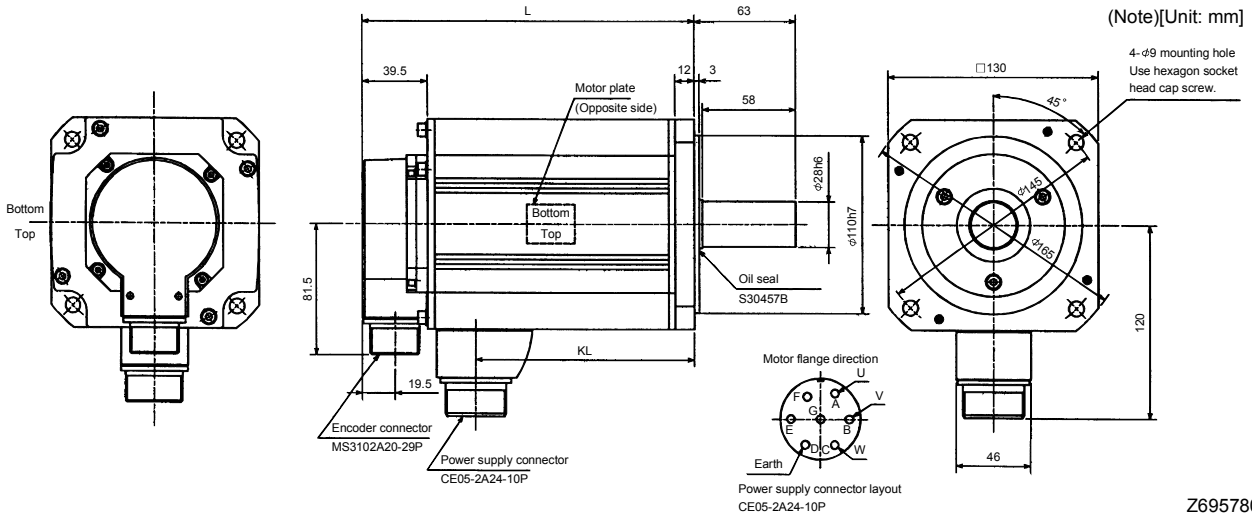


Z694853*
(BC11697*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Mass [kg]
				L	KL	
HC-RF353	HC-RFS353	3.5	8.6	217	148	12
HC-RF503	HC-RFS503	5.0	12.0	274	205	17

(Note)[Unit: mm]



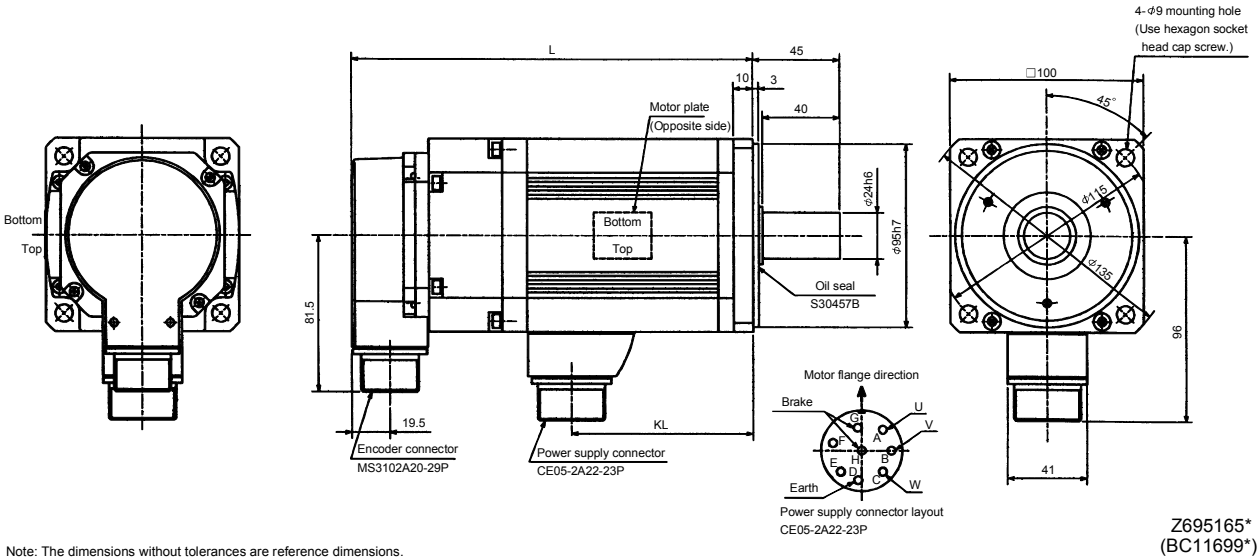
Z695780*
(BC11698*)

Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
			L	KL		
HC-RF103B HC-RFS103B	1.0	1.85	185	71	7	6.0
HC-RF153B HC-RFS153B	1.5	2.25	210	96	7	7.0
HC-RF203B HC-RFS203B	2.0	2.65	235	121	7	8.3

(Note)[Unit: mm]

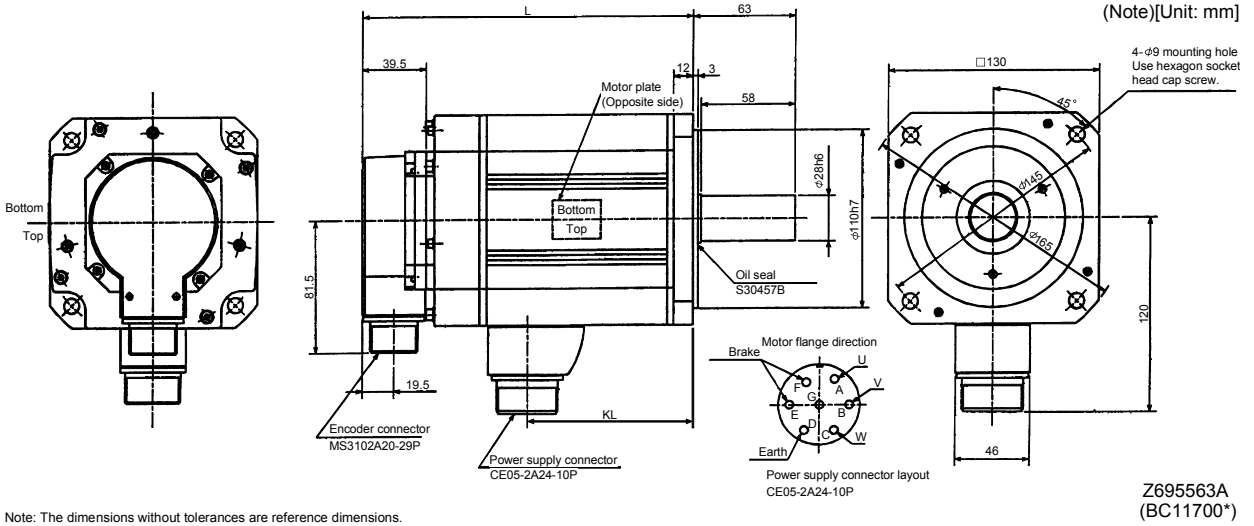


Z695165*
(BC11699*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
			L	KL		
HC-RF353B HC-RFS353B	3.5	11.8	254	148	16.7	15
HC-RF503B HC-RFS503B	5.0	15.5	311	205	16.7	21

(Note)[Unit: mm]



Z695563A
(BC11700*)

Note: The dimensions without tolerances are reference dimensions.

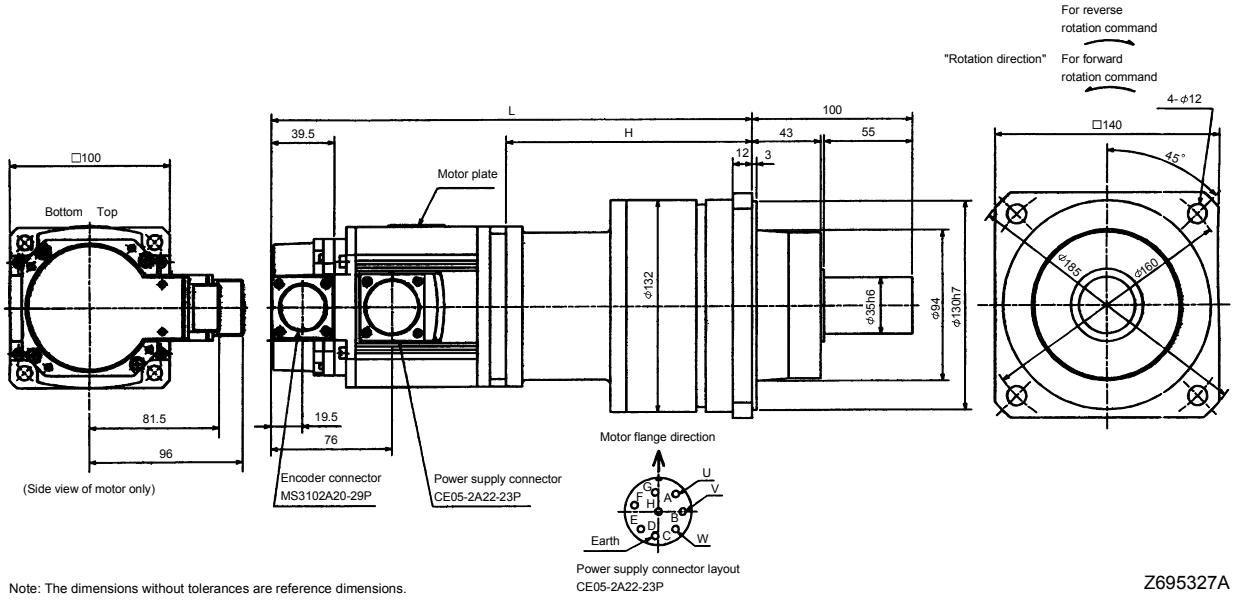
(3) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Mass [kg]
						L	H	
HC-RF103G2	HC-RFS103G2	1.0	BL2-05B-10MEKD	1/5	4.95	301	154	11.9
HC-RF103G2	HC-RFS103G2	1.0	BL2-09B-10MEKD	1/9	4.6	313	166	11.9
HC-RF153G2	HC-RFS153G2	1.5	BL2-05B-15MEKD	1/5	5.35	326	154	13
HC-RF203G2	HC-RFS203G2	2.0	BL2-05B-20MEKD	1/5	5.75	351	154	14.2

(Note)[Unit: mm]

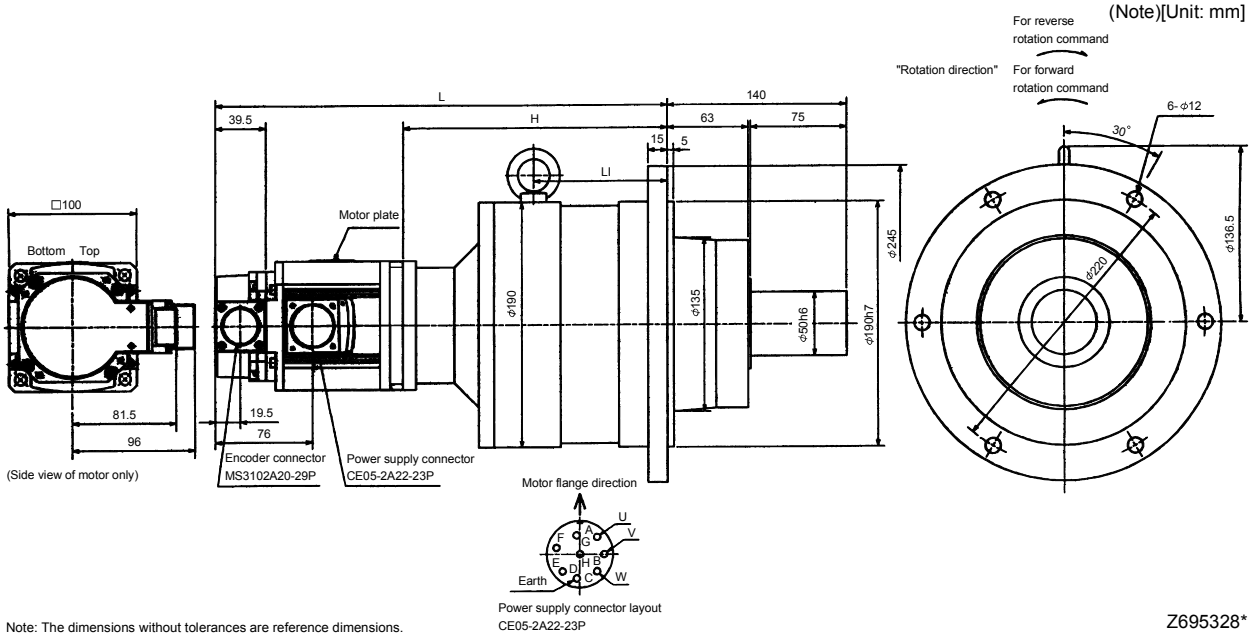


Note: The dimensions without tolerances are reference dimensions.

Z695327A

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions			Mass [kg]
						L	H	LI	
HC-RF103G2	HC-RFS103G2	1.0	BL3-20B-10MEKD	1/20	8.35	354	207	105	28.9
HC-RF103G2	HC-RFS103G2	1.0	BL3-29B-10MEKD	1/29	6.45	354	207	105	28.9
HC-RF103G2	HC-RFS103G2	1.0	BL3-45B-10MEKD	1/45	5.48	364	217	115	28.9
HC-RF153G2	HC-RFS153G2	1.5	BL3-09B-15MEKD	1/9	6.68	375	203	101	30
HC-RF153G2	HC-RFS153G2	1.5	BL3-20B-15MEKD	1/20	8.75	379	207	105	30
HC-RF153G2	HC-RFS153G2	1.5	BL3-29B-15MEKD	1/29	6.85	379	207	105	30
HC-RF203G2	HC-RFS203G2	2.0	BL3-09B-20MEKD	1/9	7.08	400	203	101	31.2
HC-RF203G2	HC-RFS203G2	2.0	BL3-20B-20MEKD	1/20	9.15	404	207	105	31.2

(Note)[Unit: mm]



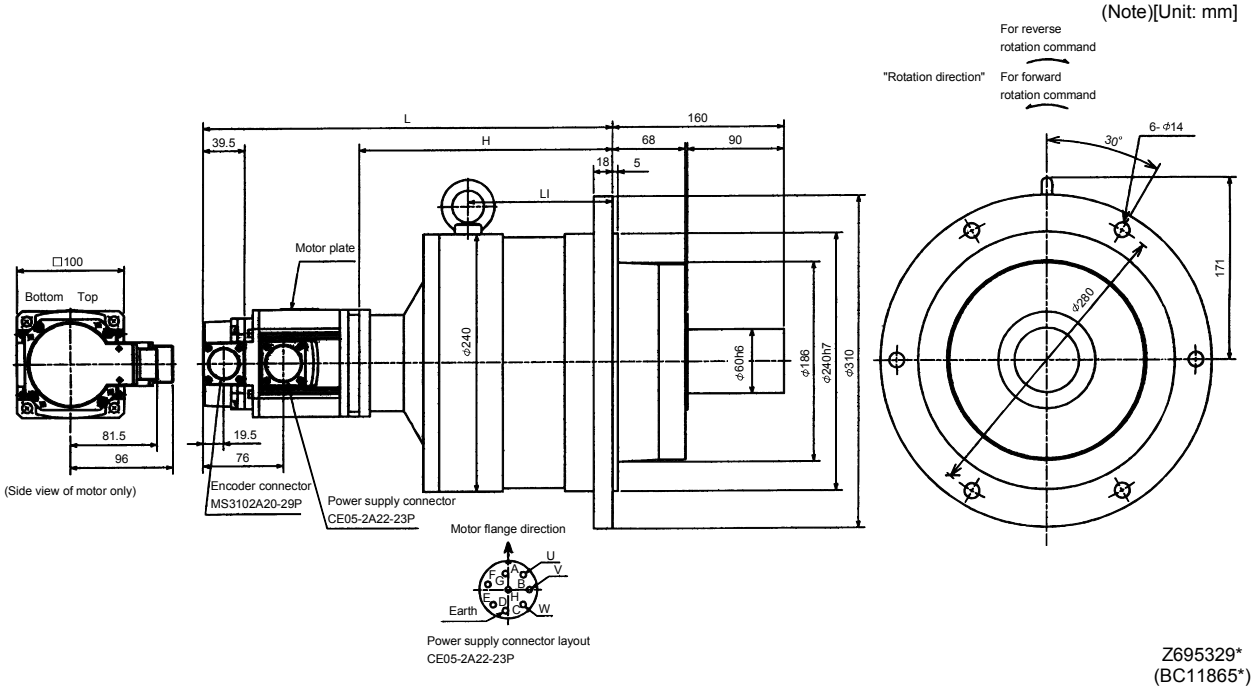
Note: The dimensions without tolerances are reference dimensions.

Z695328*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions L	H	LI	Mass [kg]
HC-RF153G2 HC-RFS153G2	1.5	BL4-45B-15MEKD	1/45	8.55	410	238	136	50
HC-RF203G2 HC-RFS203G2	2.0	BL4-29B-20MEKD	1/29	12.7	425	228	126	51.2
HC-RF203G2 HC-RFS203G2	2.0	BL4-45B-20MEKD	1/45	8.98	435	238	136	51.2

(Note)[Unit: mm]

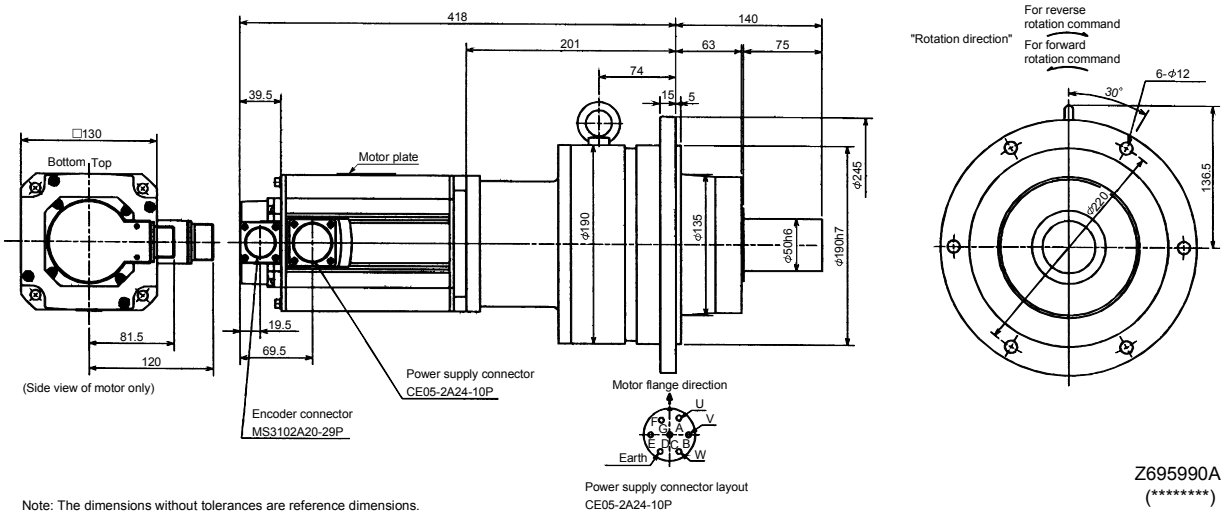


Z695329*
(BC11865*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-RF353G2 HC-RFS353G2	3.5	BL3-05B-35MEKD	1/5	18.8	30

(Note)[Unit: mm]

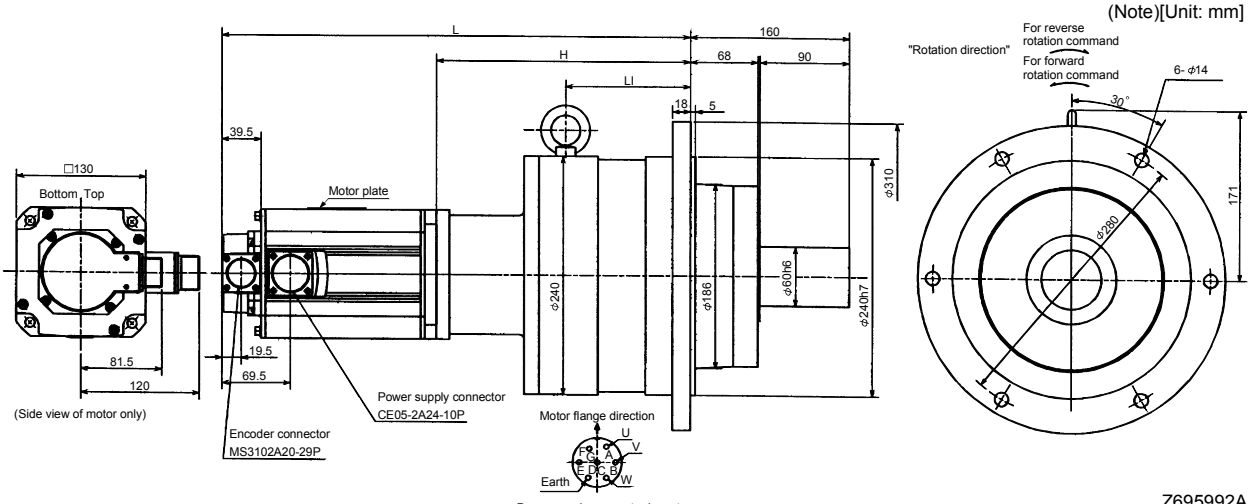


Z695990A
(********)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions			Mass [kg]
						L	H	Ll	
HC-RF353G2	HC-RFS353G2	3.5	BL4-09B-35MEKD	1/9	21.1	470	253	126	57
HC-RF353G2	HC-RFS353G2	3.5	BL4-20B-35MEKD	1/20	28.8	470	253	126	57
HC-RF353G2	HC-RFS353G2	3.5	BL4-29B-35MEKD	1/29	22.0	470	253	126	57
HC-RF503G2	HC-RFS503G2	5.0	BL4-05B-50MEKD	1/5	32.4	495	221	94	52
HC-RF503G2	HC-RFS503G2	5.0	BL4-09B-50MEKD	1/9	24.5	527	253	126	62
HC-RF503G2	HC-RFS503G2	5.0	BL4-20B-50MEKD	1/20	32.2	527	253	126	62

(Note)[Unit: mm]



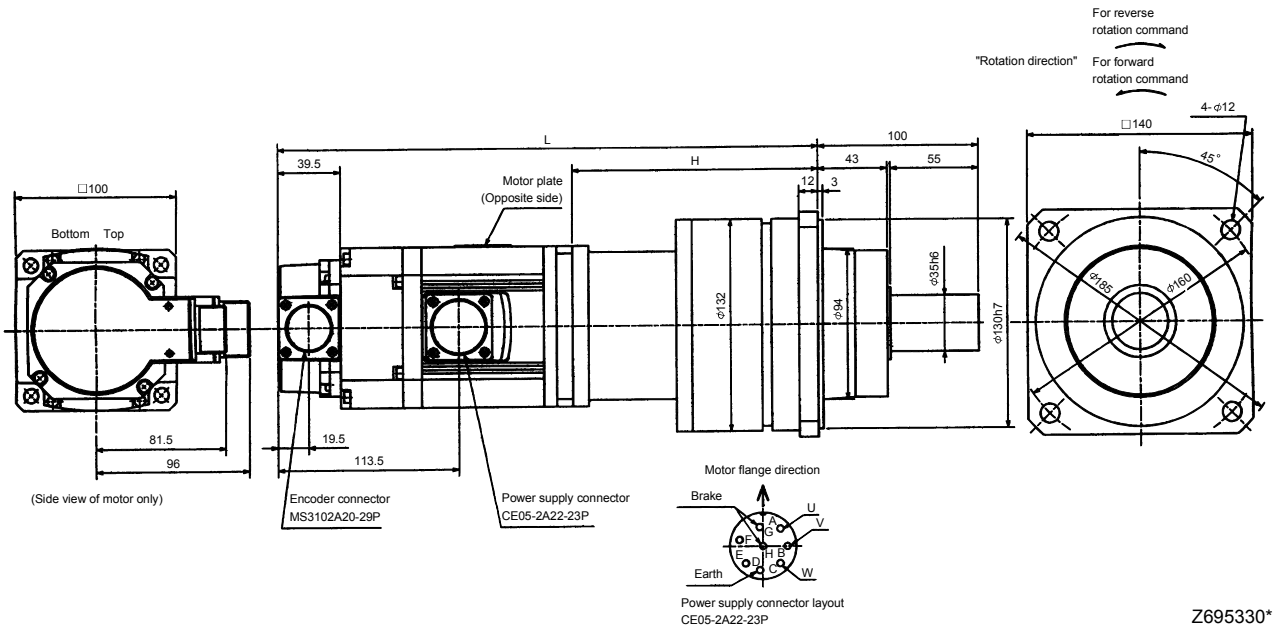
Note: The dimensions without tolerances are reference dimensions.

Z695992A
(********)

(b) With electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions		Brake static friction torque [N・m]	Mass [kg]
						L	H		
HC-RF103BG2	HC-RFS103BG2	1.0	BL2-05B-10MEKD	1/5	5.3	339	154	7	14
HC-RF103BG2	HC-RFS103BG2	1.0	BL2-09B-10MEKD	1/9	4.95	351	166	7	14
HC-RF153BG2	HC-RFS153BG2	1.5	BL2-05B-15MEKD	1/5	5.7	364	154	7	15.1
HC-RF203BG2	HC-RFS203BG2	2.0	BL2-05B-20MEKD	1/5	6.1	389	154	7	16.3

(Note)[Unit: mm]

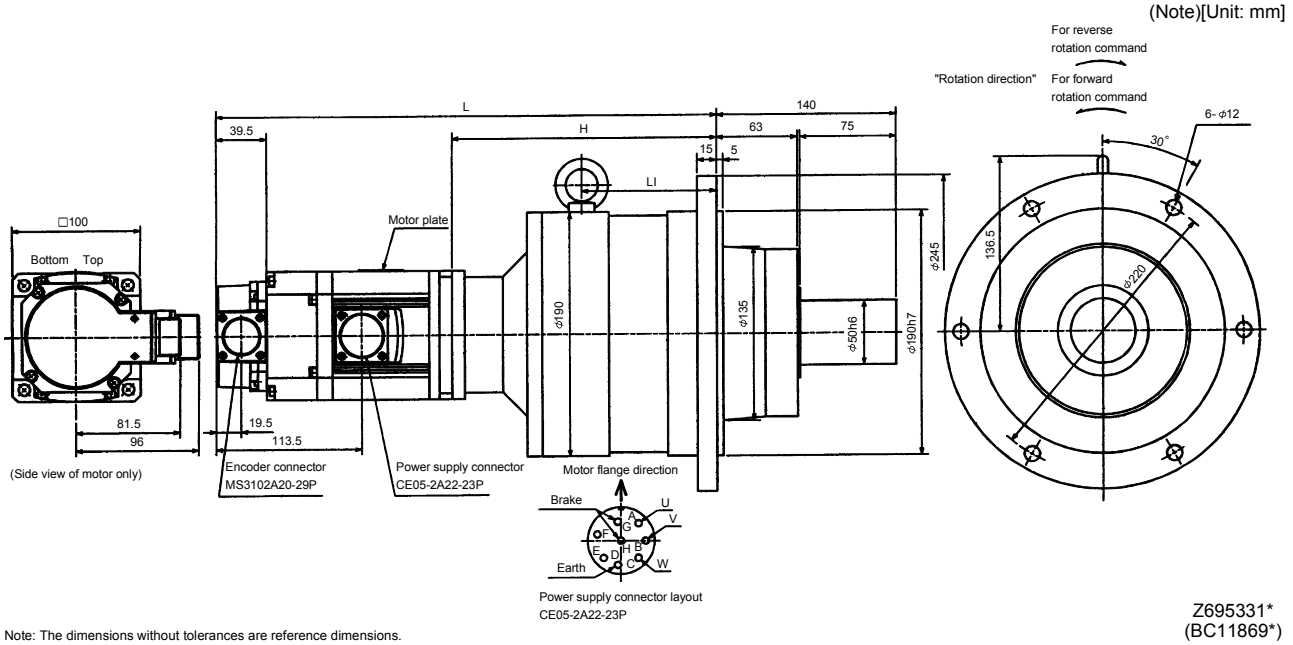


Note: The dimensions without tolerances are reference dimensions.

Z695330*
(BC11868*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions			Brake static friction torque [N・m]	Mass [kg]
						L	H	Ll		
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-20B-10MEKD	1/20	8.7	392	207	105	7	31
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-29B-10MEKD	1/29	6.8	392	207	105	7	31
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-45B-10MEKD	1/45	5.83	402	217	115	7	31
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-09B-15MEKD	1/9	7.03	413	203	101	7	32.1
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-20B-15MEKD	1/20	9.1	417	207	105	7	32.1
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-29B-15MEKD	1/29	7.2	417	207	105	7	32.1
HC-RF203BG2	HC-RFS203BG2	2.0	BL3-09B-20MEKD	1/9	7.43	438	203	101	7	33.3
HC-RF203BG2	HC-RFS203BG2	2.0	BL3-20B-20MEKD	1/20	9.5	442	207	105	7	33.3

(Note)[Unit: mm]

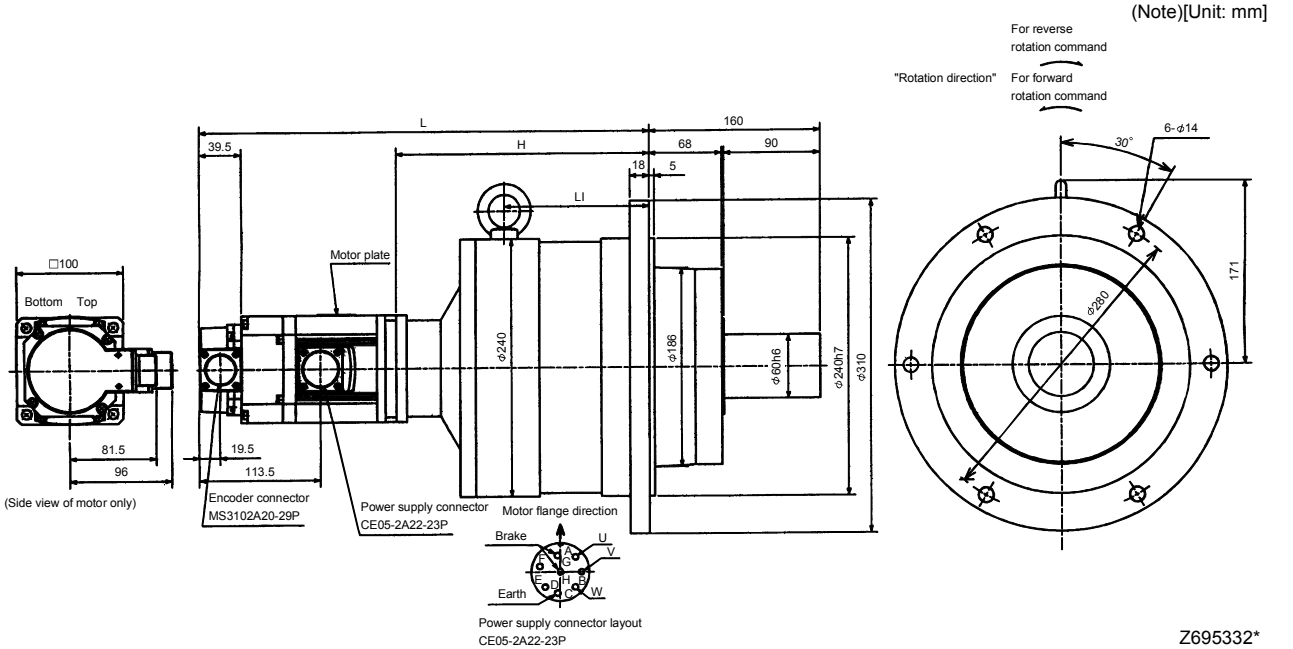


Z695331*
(BC11869*)

Note: The dimensions without tolerances are reference dimensions.

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Variable Dimensions			Brake static friction torque [N・m]	Mass [kg]
						L	H	Ll		
HC-RF153BG2	HC-RFS153BG2	1.5	BL4-45B-15MEKD	1/45	8.9	448	238	136	7	52.1
HC-RF203BG2	HC-RFS203BG2	2.0	BL4-29B-20MEKD	1/29	13.1	463	228	126	7	53.3
HC-RF203BG2	HC-RFS203BG2	2.0	BL4-45B-20MEKD	1/45	9.3	473	238	136	7	53.3

(Note)[Unit: mm]



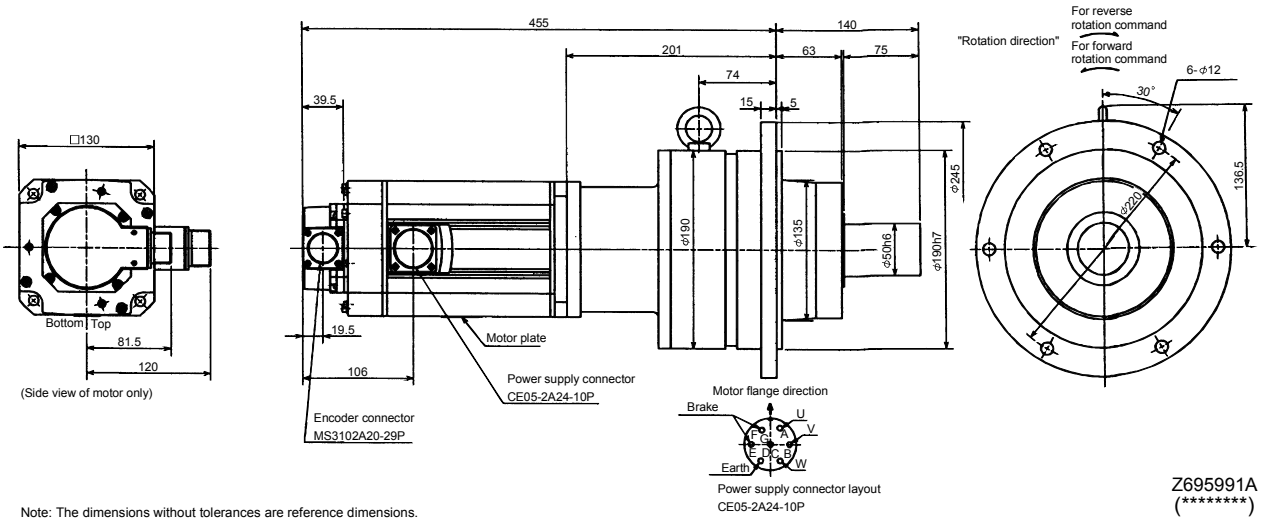
Z695332*
(BC11870*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-RF353BG2 HC-RFS353BG2	3.5	BL3-05B-35MEKD	1/5	16.7	20.8	33

(Note)[Unit: mm]

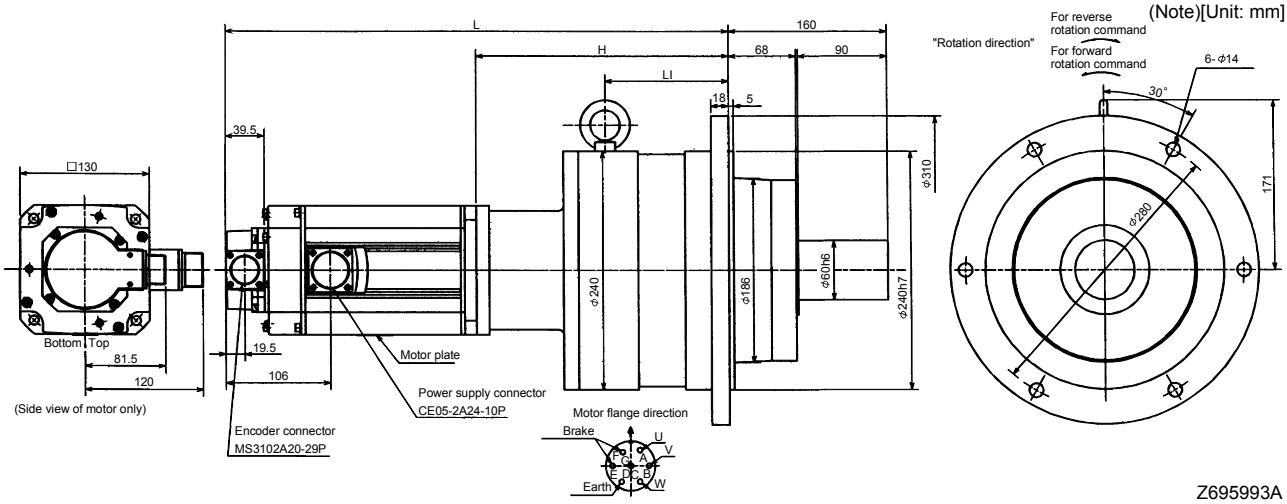


Note: The dimensions without tolerances are reference dimensions.

Z695991A
(********)

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions			Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
				L	H	LI			
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-09B-35MEKD	1/9	507	253	126	16.7	23.1	60
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-20B-35MEKD	1/20	507	253	126	16.7	30.8	60
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-29B-35MEKD	1/29	507	253	126	16.7	22.0	60
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-05B-50MEKD	1/5	532	221	94	16.7	34.4	56
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-09B-50MEKD	1/9	564	253	126	16.7	26.5	66
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-20B-50MEKD	1/20	564	253	126	16.7	34.2	66

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

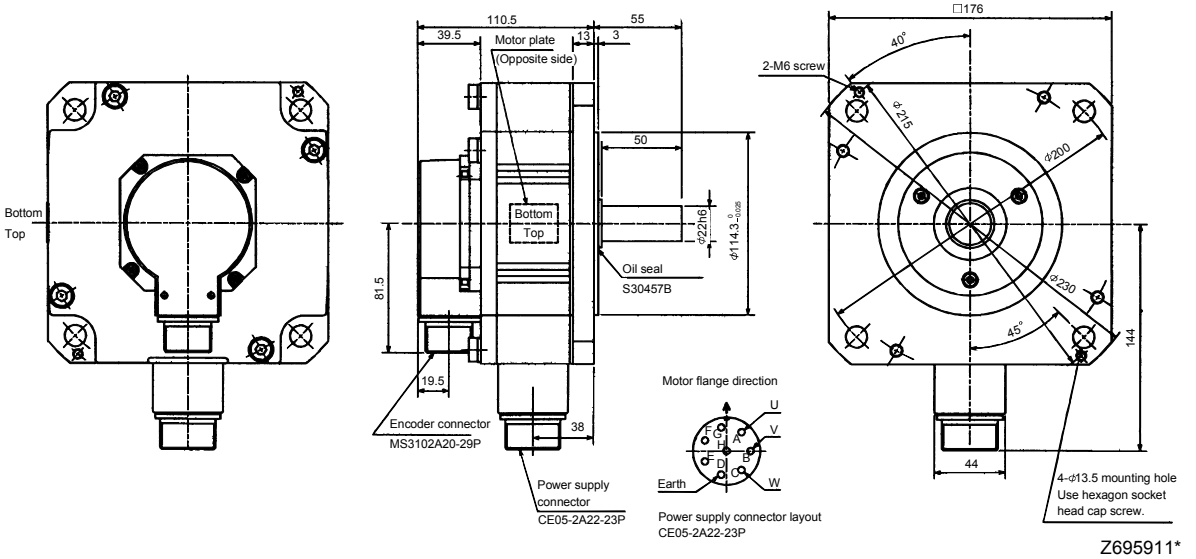
Z695993A
(********)

7.1.5 HC-UF 2000r/min ▪ HC-UFS 2000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [kW]	Inertia Moment J[×10^{-4}kg ▪ m^2]	Mass [kg]
HC-UF72 HC-UFS72	0.75	10.4	8

(Note)[Unit: mm]

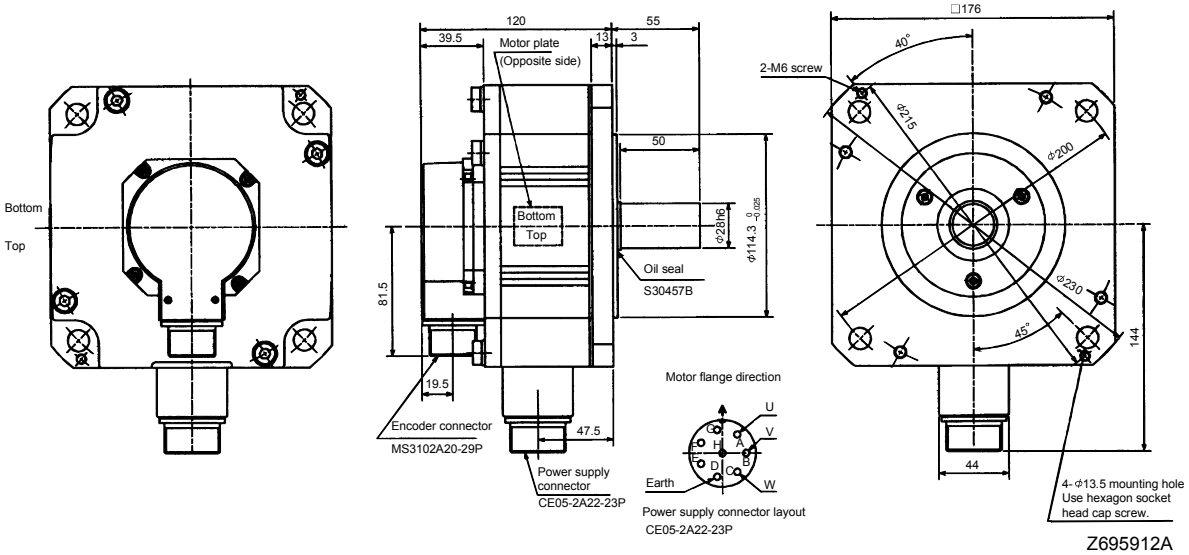


Z695911*
(BC11711*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg ▪ m^2]	Mass [kg]
HC-UF152 HC-UFS152	1.5	22.1	11

(Note)[Unit: mm]

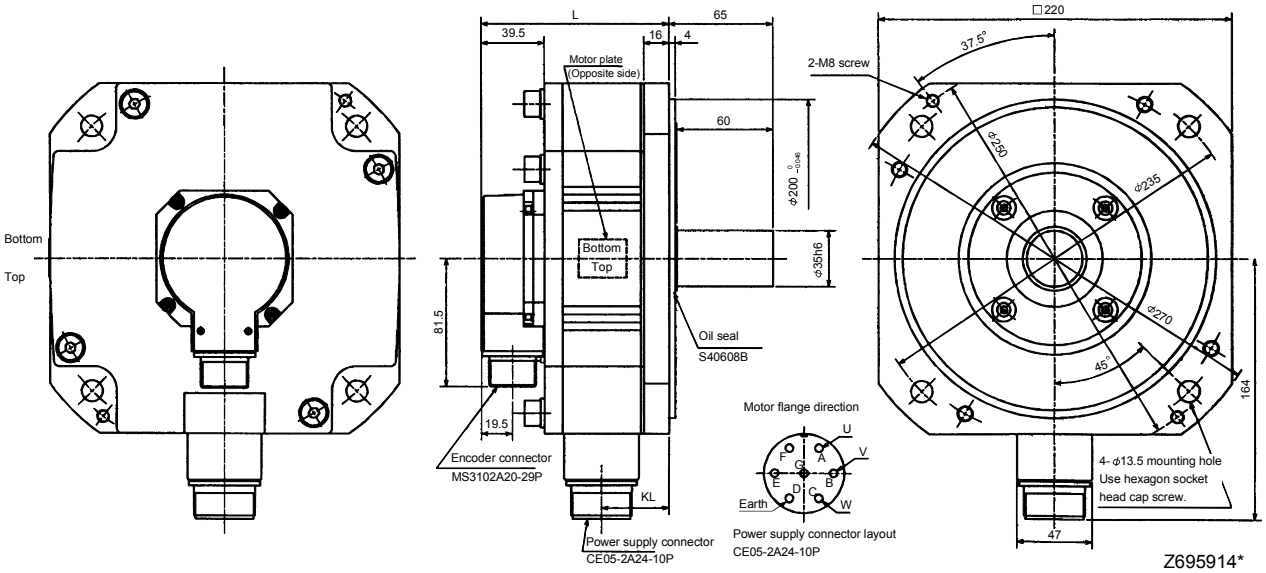


Z695912A
(BC11712*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL		
HC-UF202 HC-UFS202	2.0	118	42.5	38.2	16
HC-UF352 HC-UFS352	3.5	142	66.5	76.5	20
HC-UF502 HC-UFS502	5.0	166	90.5	115	24

(Note)[Unit: mm]



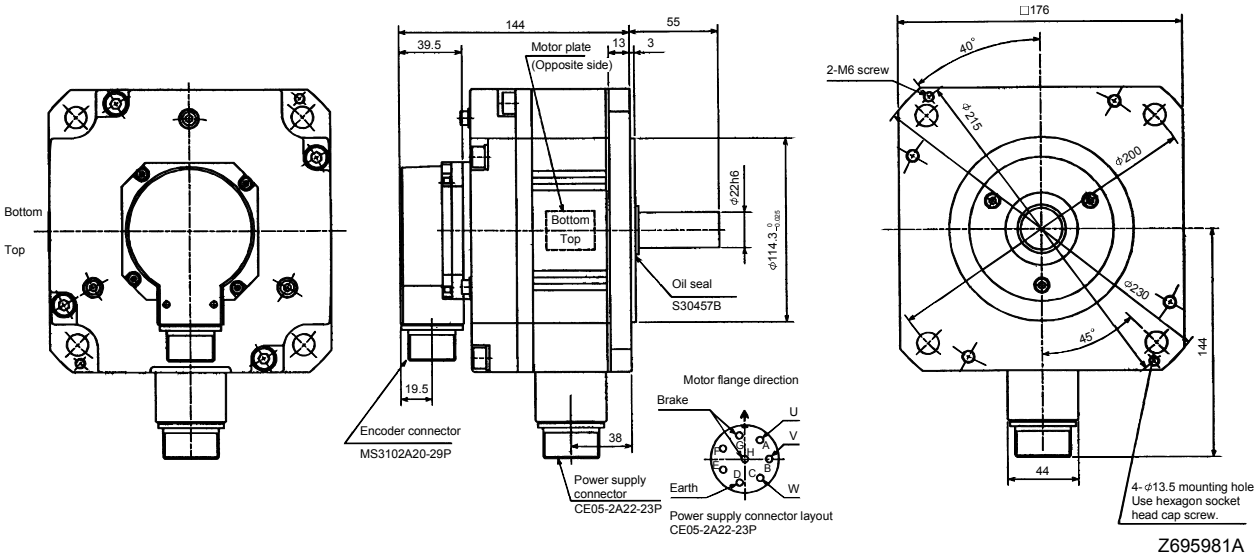
Z695914*
(BC11713* BC12764*)

Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF72B HC-UFS72B	0.75	8.5	12.4	10

(Note)[Unit: mm]



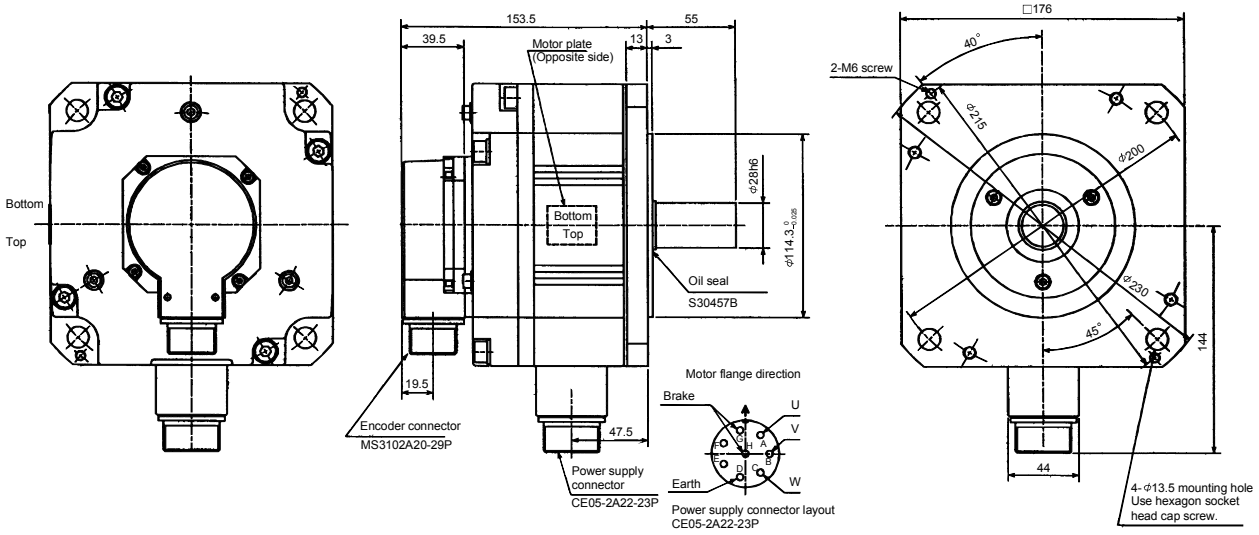
Z695981A
(BC11714*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF152B HC-UFS152B	1.5	8.5	24.1	13

(Note)[Unit: mm]

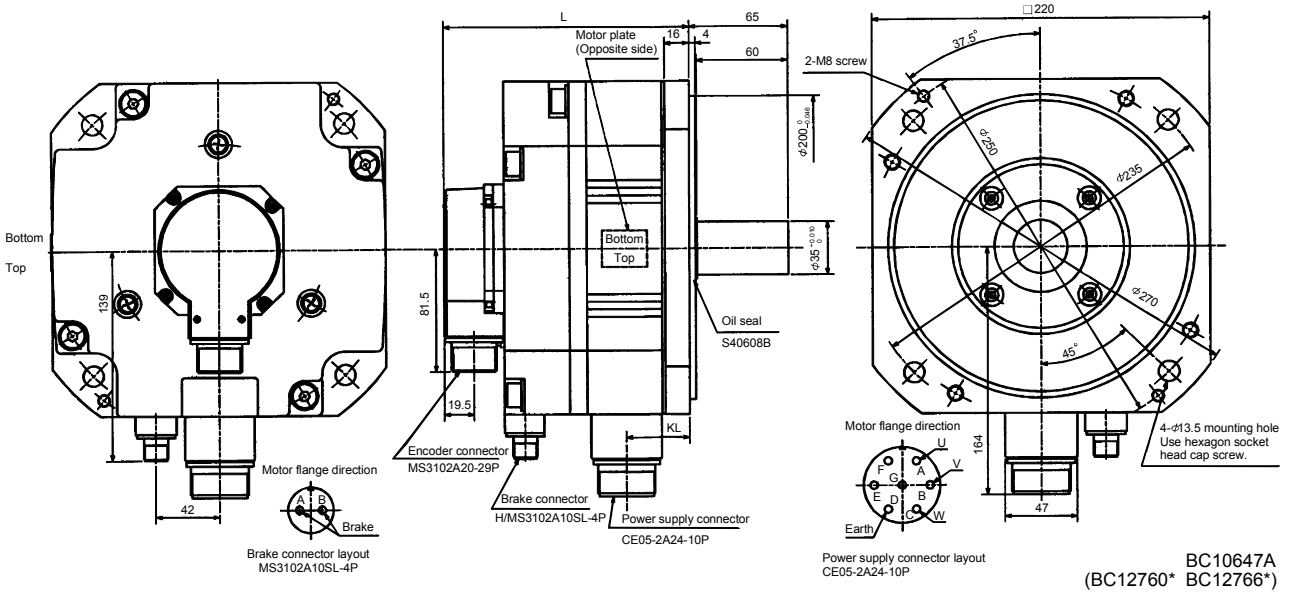


Z695982B
(BC11715*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-UF202B HC-UFS202B	2.0	161	42.5	43.1	46.8	22
HC-UF352B HC-UFS352B	3.5	185	66.5	43.1	85.1	26
HC-UF502B HC-UFS502B	5.0	209	90.5	43.1	123.6	30

(Note)[Unit: mm]



BC10647A
(BC12760* BC12766*)

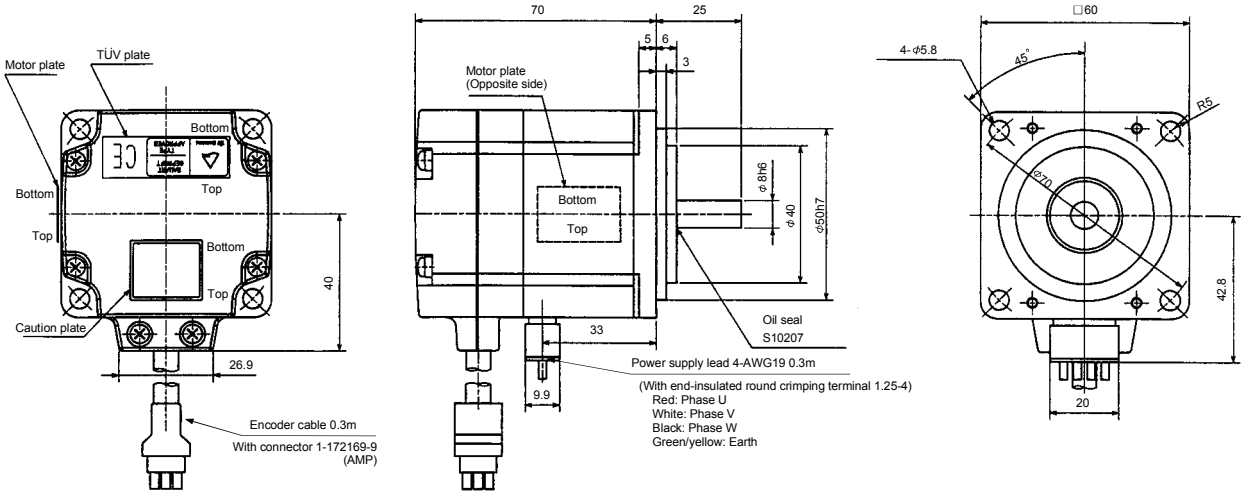
Note: The dimensions without tolerances are reference dimensions.

7.1.6 HC-UF 3000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF13	100	0.066	0.8

(Note)[Unit: mm]

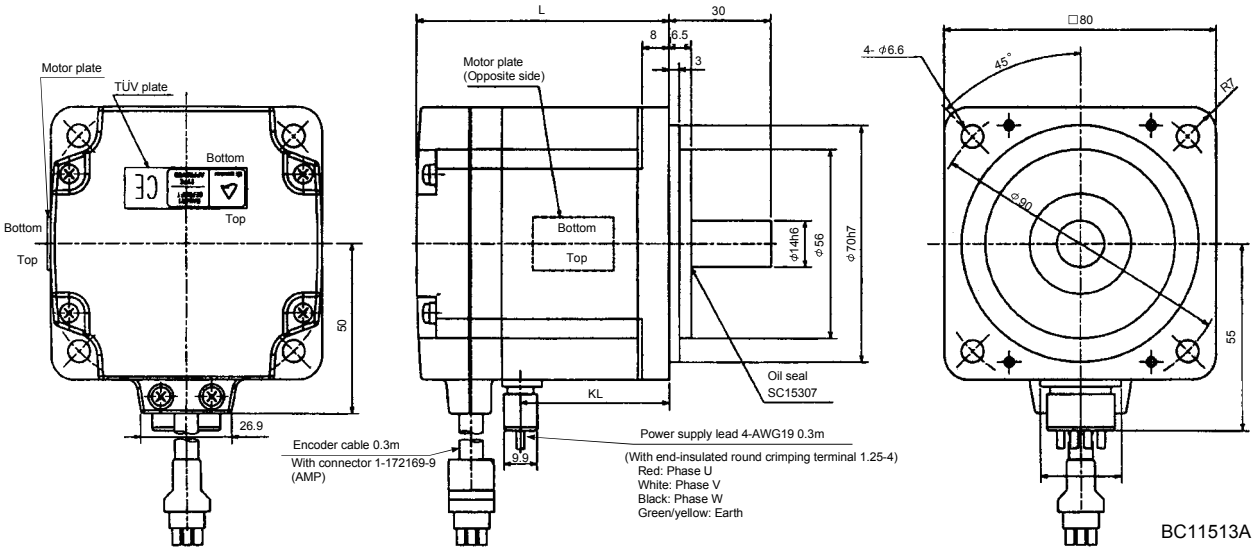


BC11740A

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF23	200	77	43.8	0.241	1.5
HC-UF43	400	92	58.8	0.365	1.7

(Note)[Unit: mm]



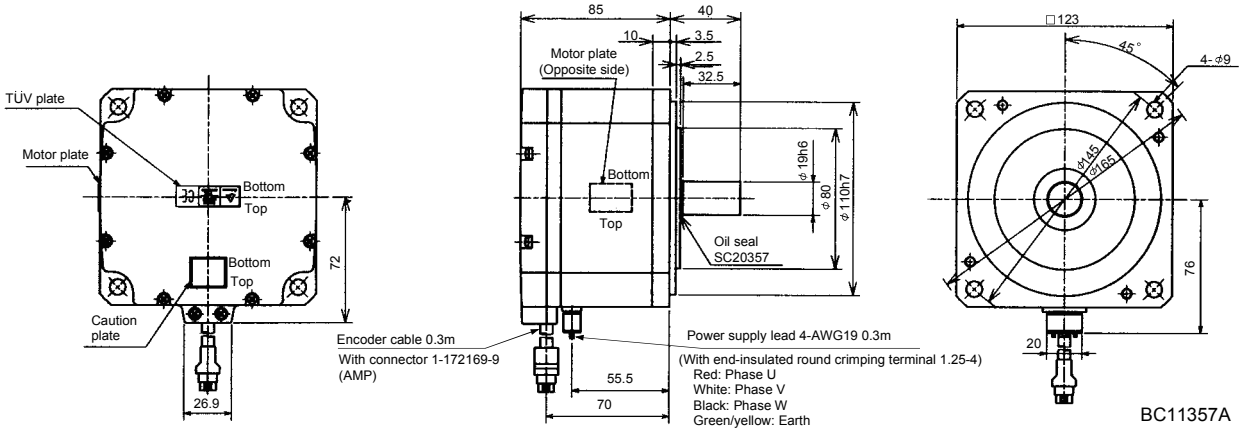
BC11513A

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF73	750	5.9	5.0

(Note)[Unit: mm]

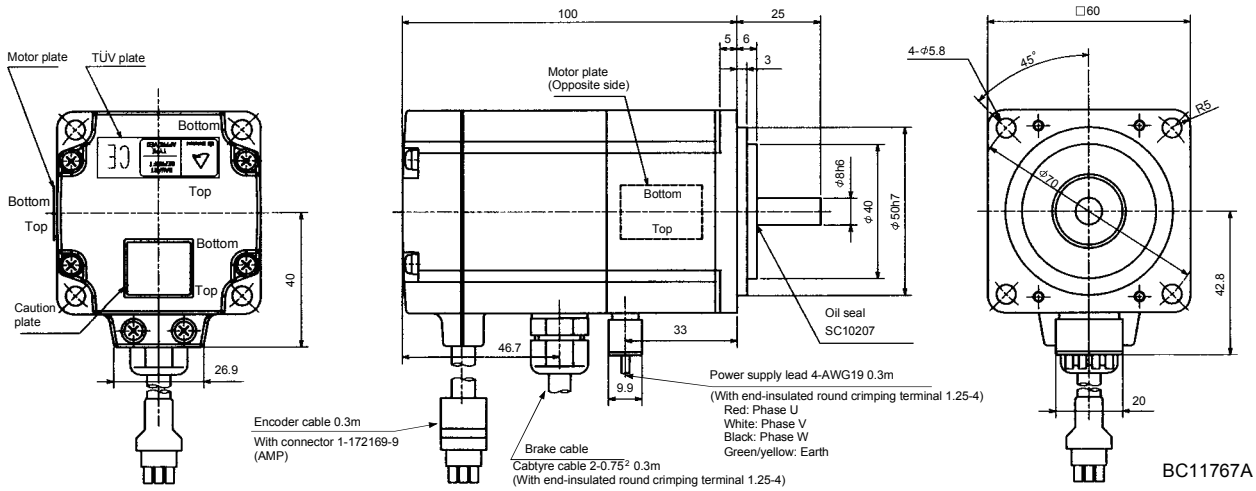


Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output (W)	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF13B	100	0.32	0.074	1.2

(Note)[Unit: mm]

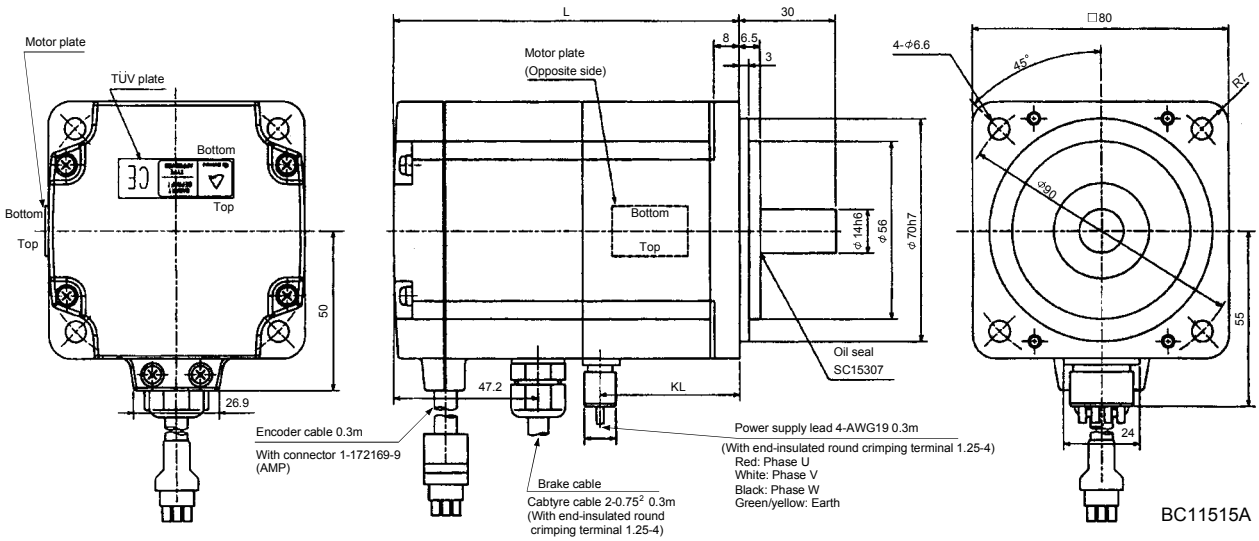


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J [$\times 10^{-4}$kg・m^2]	Mass [kg]
		L	KL			
HC-UF23B	200	111	43.8	1.3	0.323	2.2
HC-UF43B	400	126	58.8	1.3	0.447	2.4

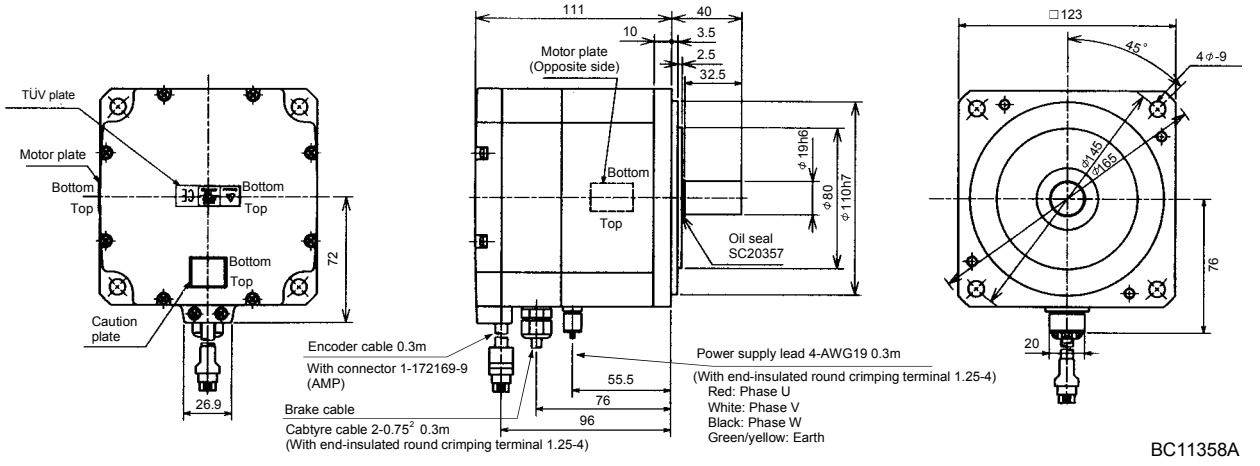
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Mass [kg]
HC-UF73B	750	2.4	6.1	6.2

(Note)[Unit: mm]



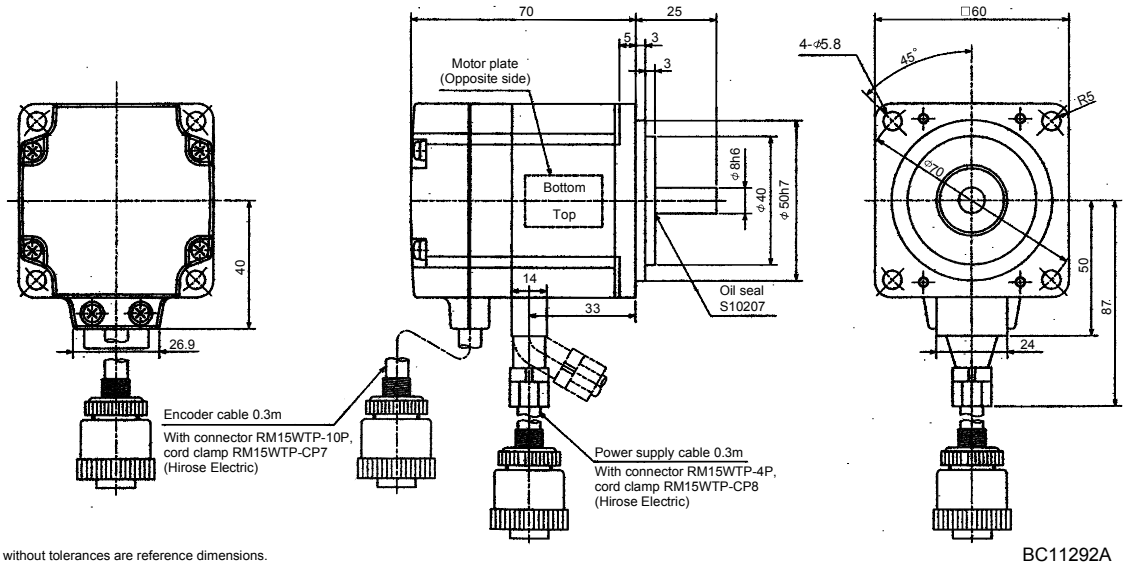
Note: The dimensions without tolerances are reference dimensions.

7.1.7 HC-UF3000r/min, HC-UFS3000r/min series with IP65-compliant connectors

(1) Without electromagnetic brake

Model		Output [W]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HC-UF13-S1	HC-UFS13-S1	100	0.066	0.8

(Note)[Unit: mm]

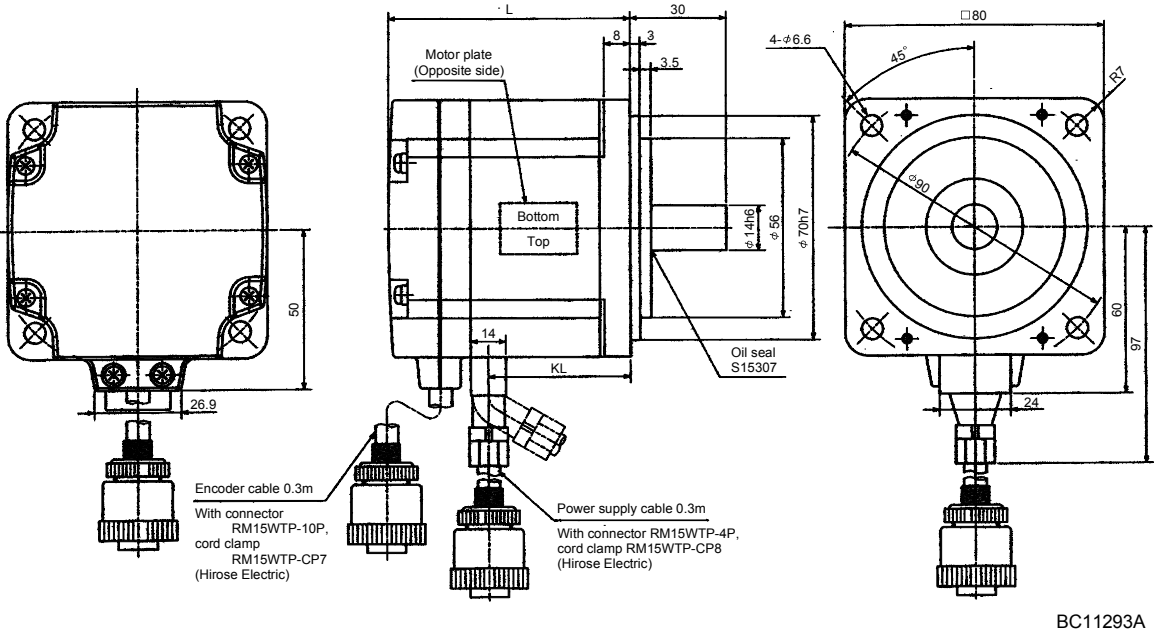


Note: The dimensions without tolerances are reference dimensions.

BC11292A

Model		Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HC-UF23-S1	HC-UFS23-S1	200	75	44	0.241	1.5
HC-UF43-S1	HC-UFS43-S1	400	90	59	0.365	1.7

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

BC11293A

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF73-S1 HC-UFS73-S1	750	5.9	5.0

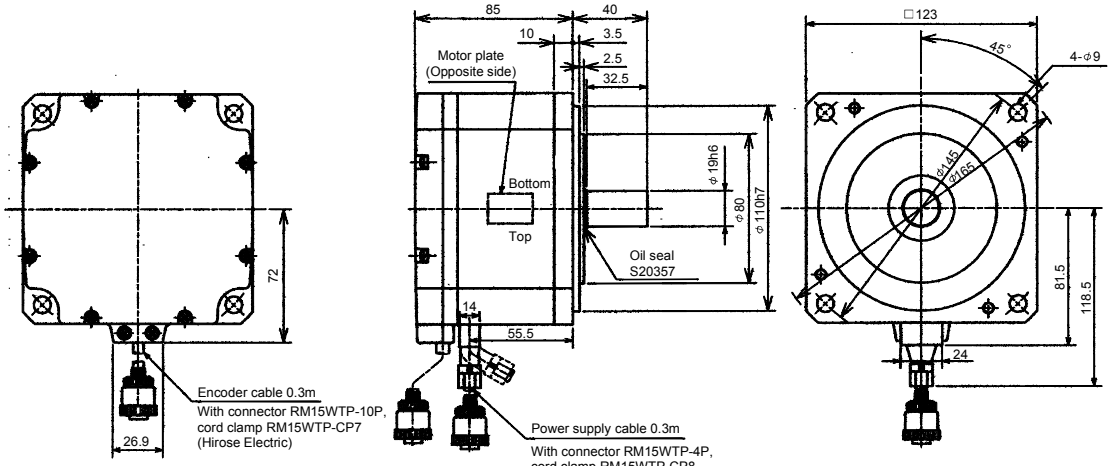
(Note)[Unit: mm]

Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	



BC11359A

Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF13B-S1 HC-UFS13B-S1	100	0.32	0.074	1.2

(Note)[Unit: mm]

Power supply connector pin connection list

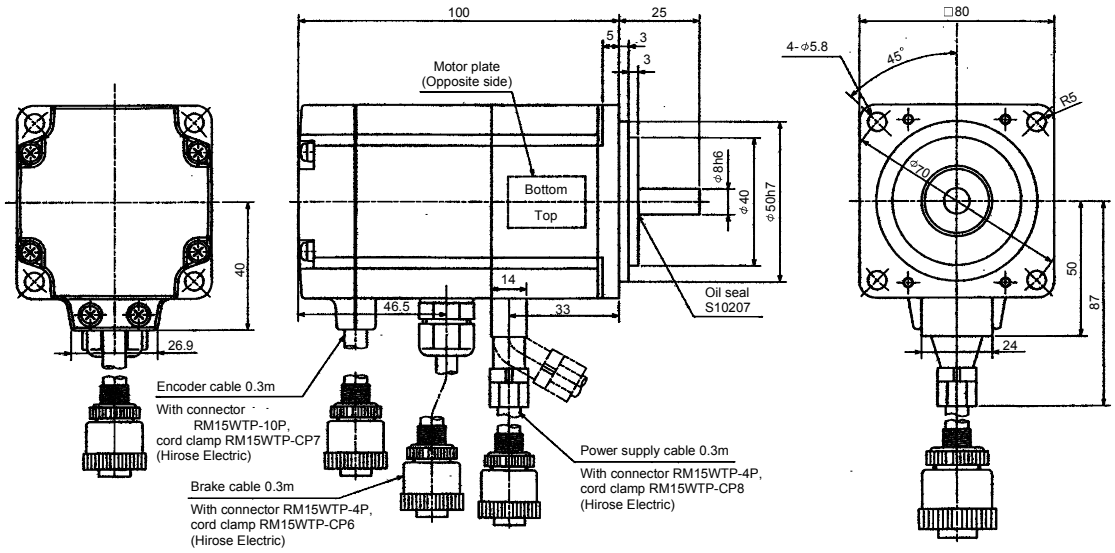
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Brake connector pin connection list

Pin No.	Application
1	B1
2	B2
3	
4	

Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	



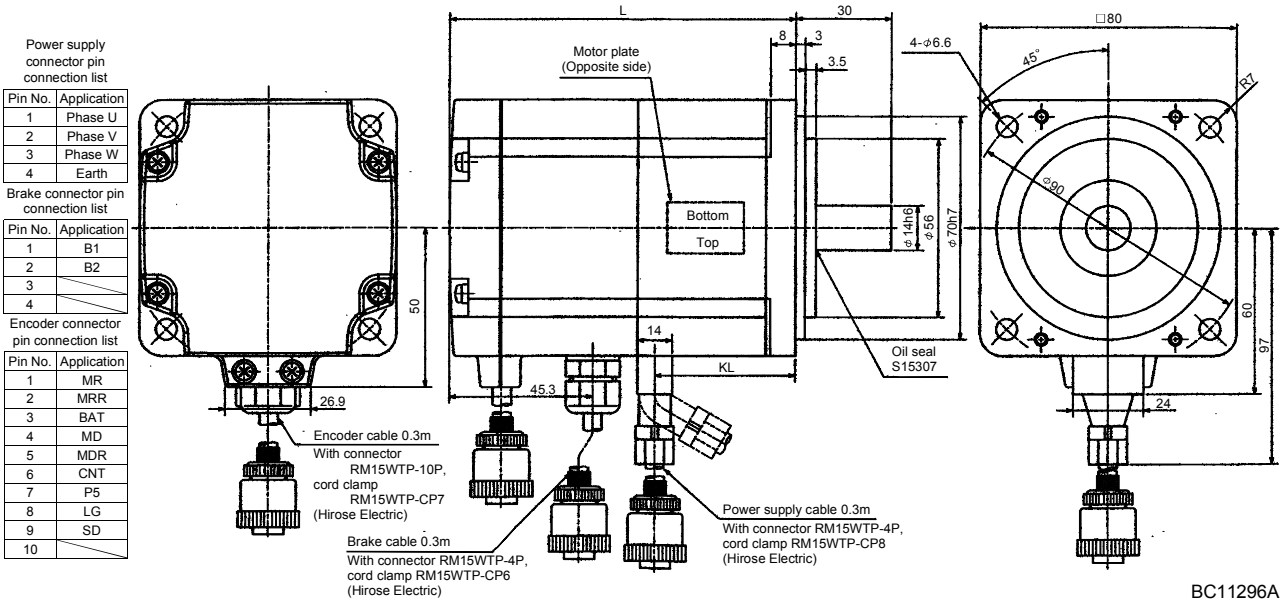
Note: The dimensions without tolerances are reference dimensions.

BC11295A

7. OUTLINE DIMENSION DRAWINGS

Model		Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
			L	KL			
HC-UF23B-S1	HC-UFS23B-S1	200	109	44	1.3	0.323	2.2
HC-UF43B-S1	HC-UFS43B-S1	400	124	59	1.3	0.447	2.4

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Brake connector pin connection list

Pin No.	Application
1	B1
2	B2
3	
4	

Encoder connector pin connection list

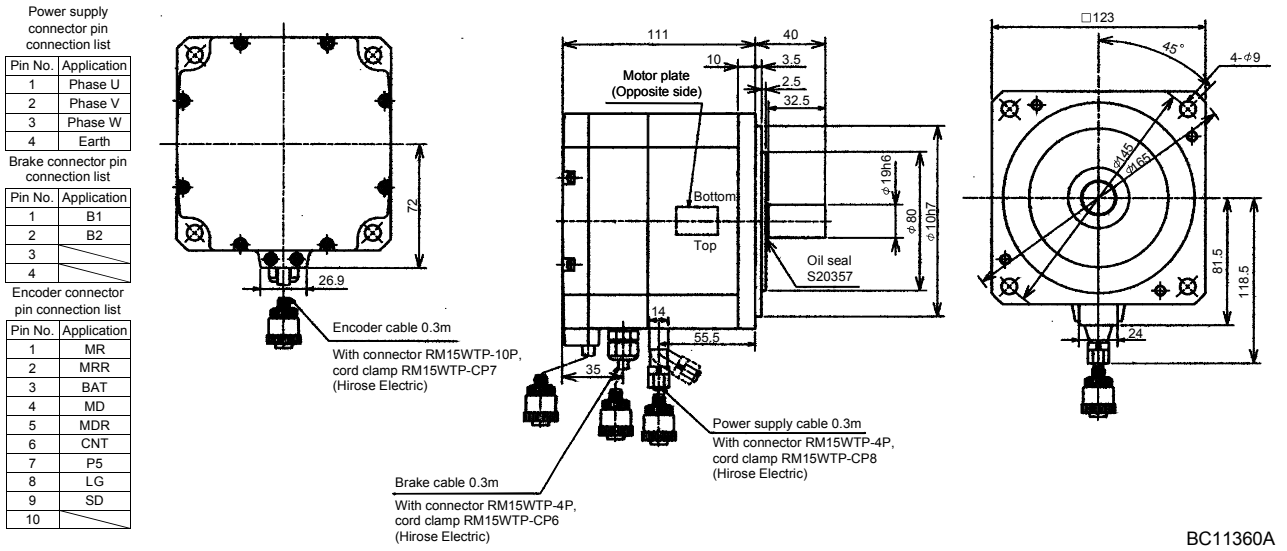
Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

BC11296A

Note: The dimensions without tolerances are reference dimensions.

Model		Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UF73B-S1	HC-UFS73B-S1	750	2.4	6.1	6.2

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Brake connector pin connection list

Pin No.	Application
1	B1
2	B2
3	
4	

Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

BC11360A

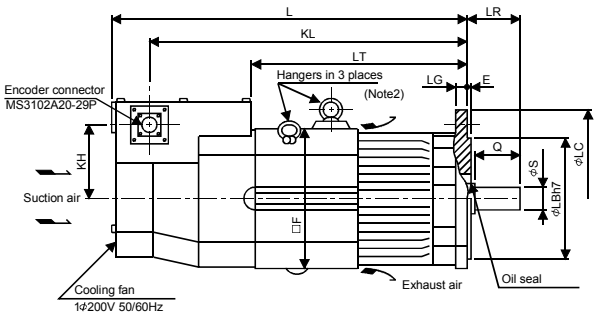
Note: The dimensions without tolerances are reference dimensions.

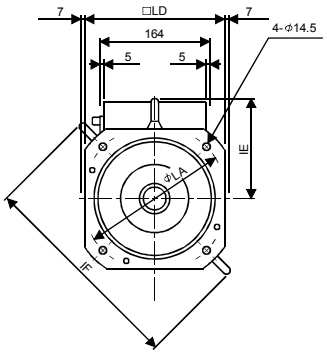
7.1.8 HA-LH series

(1) Standard (without electromagnetic brake)

Model	Variable Dimensions																	Inertia Moment J[×10⁻⁴kg・m²]	Oil Seal	Mass [kg]
	F	L	LA	LB	LC	□LD	LG	LT	KL	KH	IE	IF	Hanger	E	LR	Q	S			
HA-LH11K2(-Y)	208	529	215	180	250	204	20	316	478	102	152	317	M10	3	85	80	42h6	118	S45629B	21
HA-LH15K2(-Y)	254	578	265	230	300	250	25	362	527	117	180	376	M12	5	110	100	55m6	290	S608295	17
HA-LH22K2(-Y)		643						430	592									395		30

(Note1)[Unit: mm]

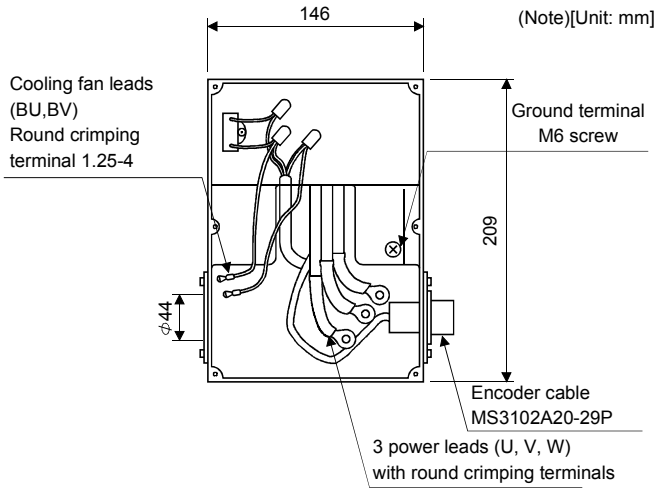




Note: 1. The dimensions without tolerances are reference dimensions.
2. When using the motor without the hangers, plug the screw holes with the following bolts:
HA-LH11K2: M10 × 15mm max.
HA-LH15K2, 22K2: M12 × 18mm max.

Terminal Box of HA-LH11K2 to 22K2

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

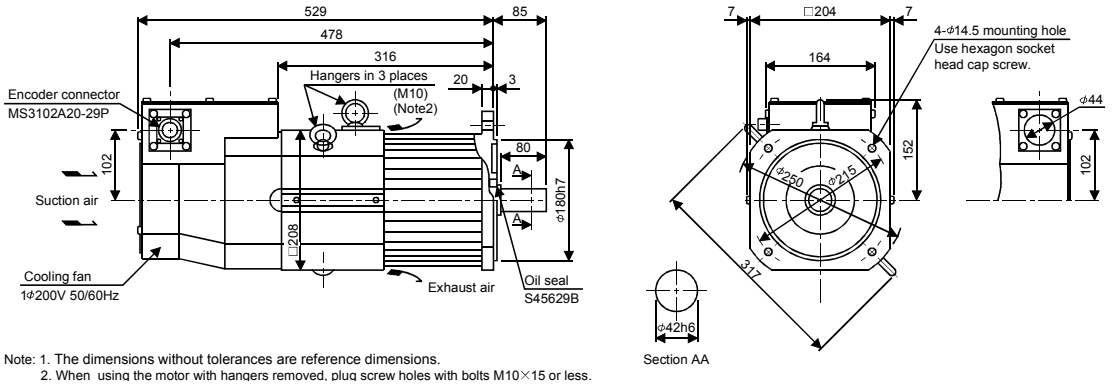
Power Connection Screw Size

Servo Motor	Power Connection Screw Size
HA-LH11K2	8-6
HA-LH15K2・22K2	14-6

(2) EN・UL/C-UL Standard-Compliant model

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LH11K2-EC	11	118	70

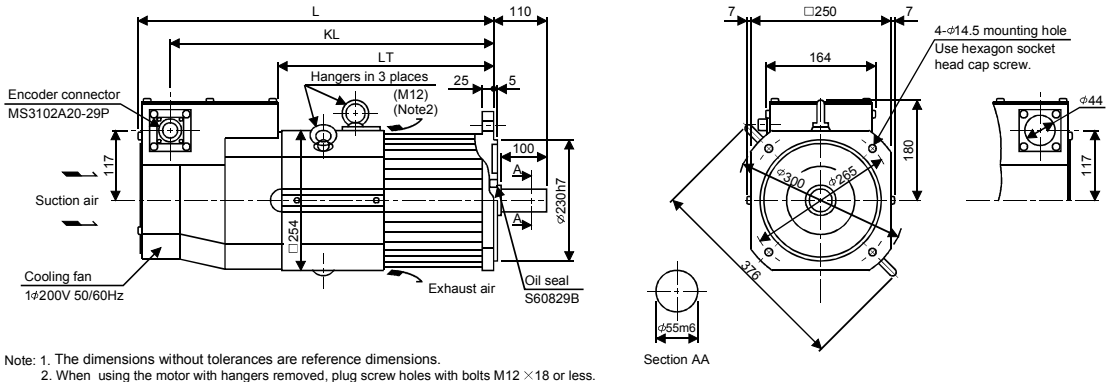
(Note1)[Unit: mm]



Note: 1. The dimensions without tolerances are reference dimensions.
2. When using the motor with hangers removed, plug screw holes with bolts M10×15 or less.

Model	Output [kW]	Variable Dimensions			Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL	LT		
HA-LH15K2-EC	15	578	527	362	290	108
HA-LH22K2-EC	22	643	592	430	1160	135

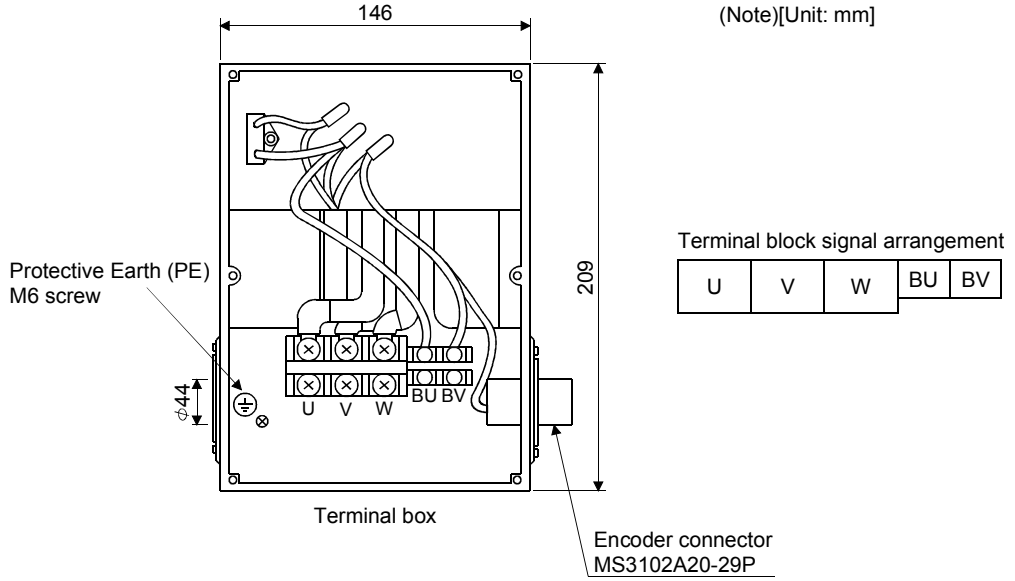
(Note1)[Unit: mm]



Note: 1. The dimensions without tolerances are reference dimensions.
2. When using the motor with hangers removed, plug screw holes with bolts M12 ×18 or less.

Terminal Box of HA-LH11K2-EC to 22K2-EC

(Note)[Unit: mm]



Terminal block signal arrangement

U	V	W	BU	BV

Note: The dimensions without tolerances are reference dimensions.

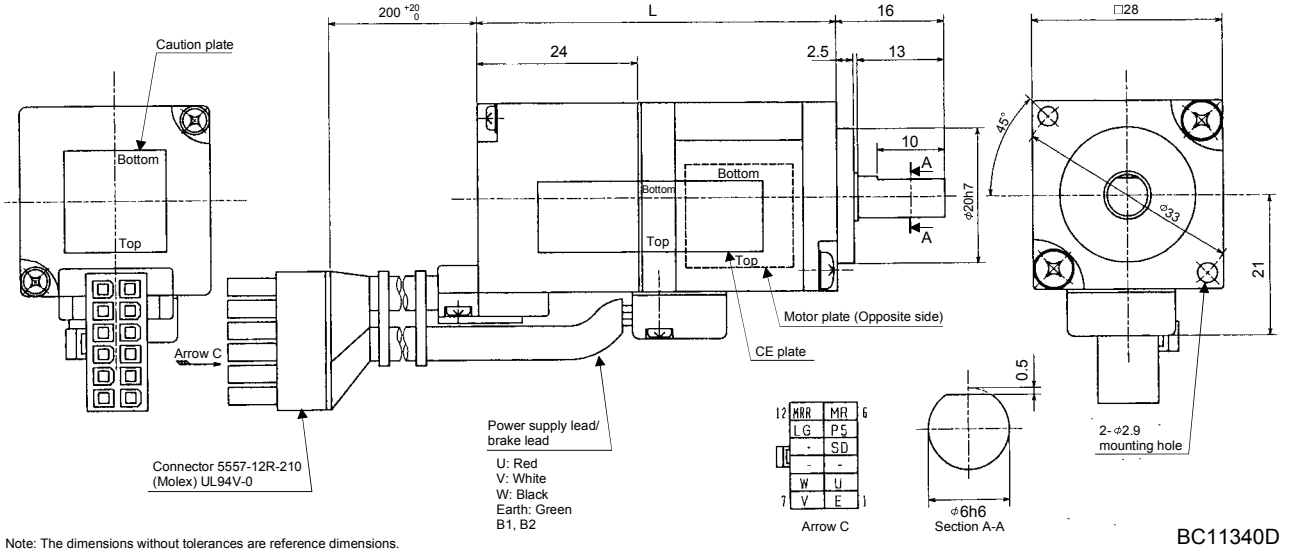
Model	Power Connection Screw Size	Fan Connection Screw Size
HA-LH11K2-EC	M6	M4
HA-LH15K2-EC・22K2-EC	M8	M4

7.1.9 HC-AQ series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Variable Dimensions L	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-AQ0135D	10	54	0.0050	0.19
HC-AQ0235D	20	61	0.0072	0.22
HC-AQ0335D	30	68	0.0094	0.25

(Note)[Unit: mm]

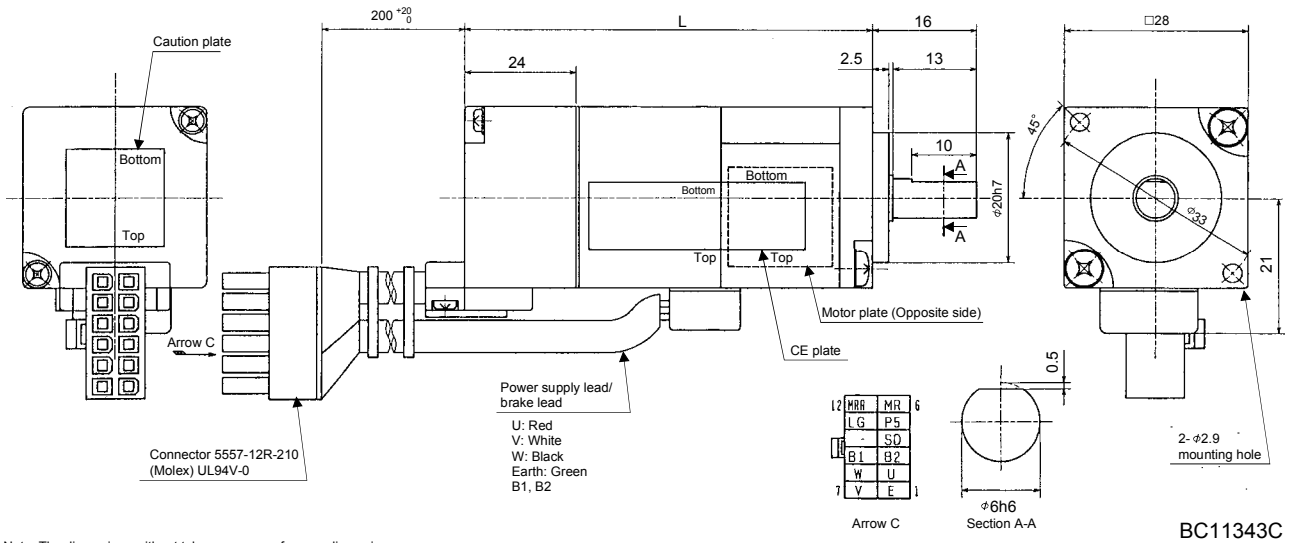


Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions L	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-AQ0135BD	10	81	0.0091	0.29
HC-AQ0235BD	20	88	0.0113	0.32
HC-AQ0335BD	30	95	0.0135	0.35

(Note)[Unit: mm]



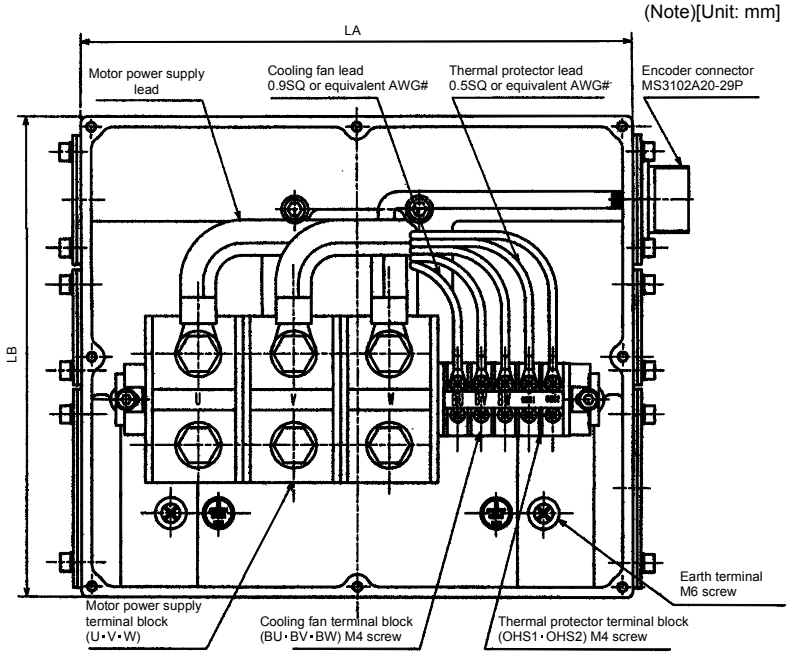
Note: The dimensions without tolerances are reference dimensions.

7.1.10 HA-LF series

Terminal box detail diagram

Motor Model		HA-LF30K2 HA-LF37K2 HA-LF30K24 HA-LF37K24	HA-LF45K24 HA-LF55K24
Motor power supply lead size		8mm²(AWG8) ×2 parallel	22mm²(AWG4) ×2 parallel
Motor power supply terminal block screw size		M8	M10
Terminal box dimensions (mm)	LA	220	266
	LB	210	230

(Note)[Unit: mm]

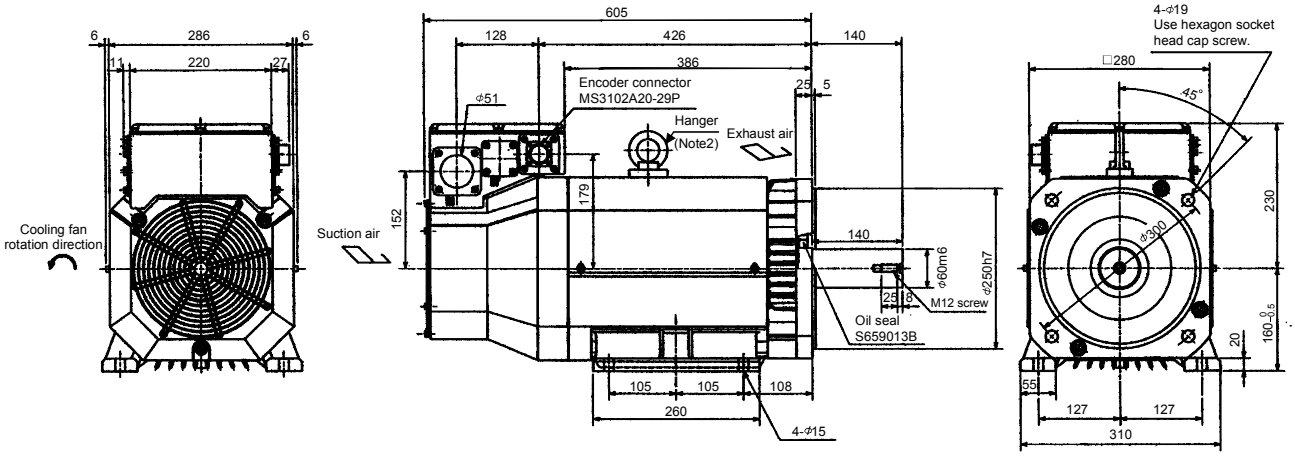


BG71994C

Note: The dimensions without tolerances are reference dimensions.

Model	Output [kW]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HA-LF30K24	30	550	160

(Note1)[Unit: mm]



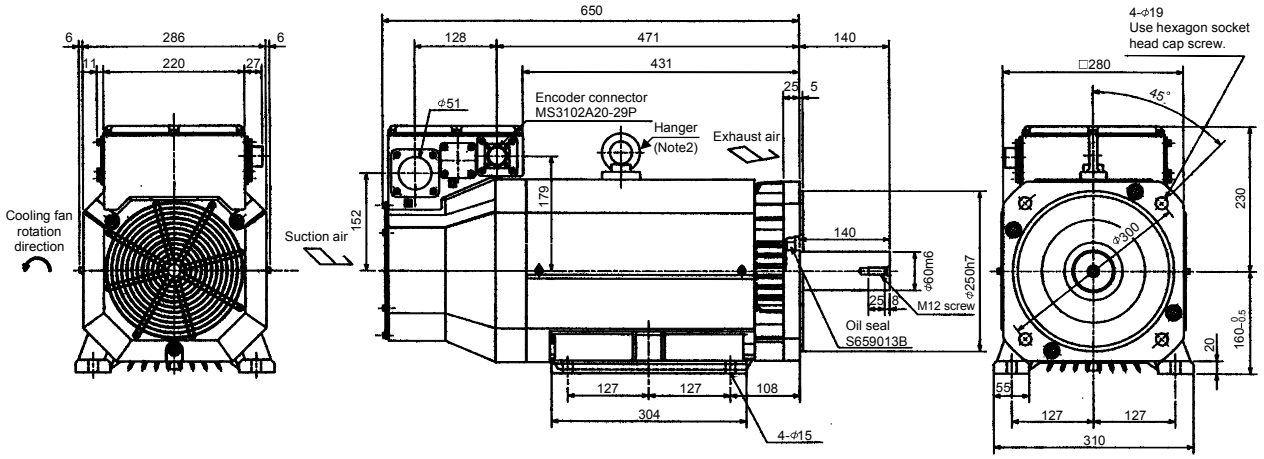
Note: 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10833

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LF37K24	37	650	180

(Note1)[Unit: mm]

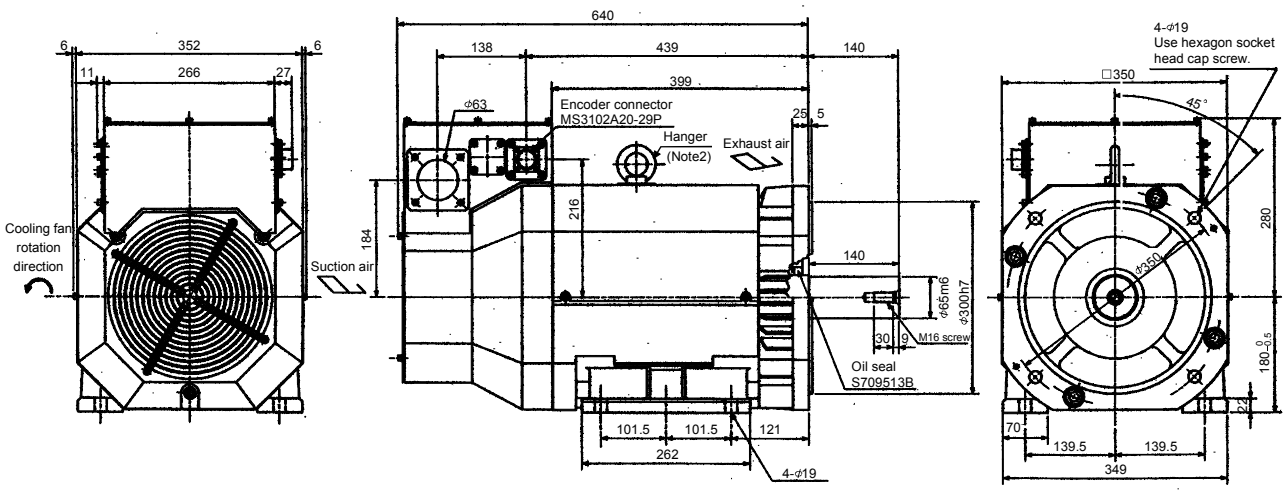


Note: 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10788C

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LF45K24	45	1080	230

(Note1)[Unit: mm]



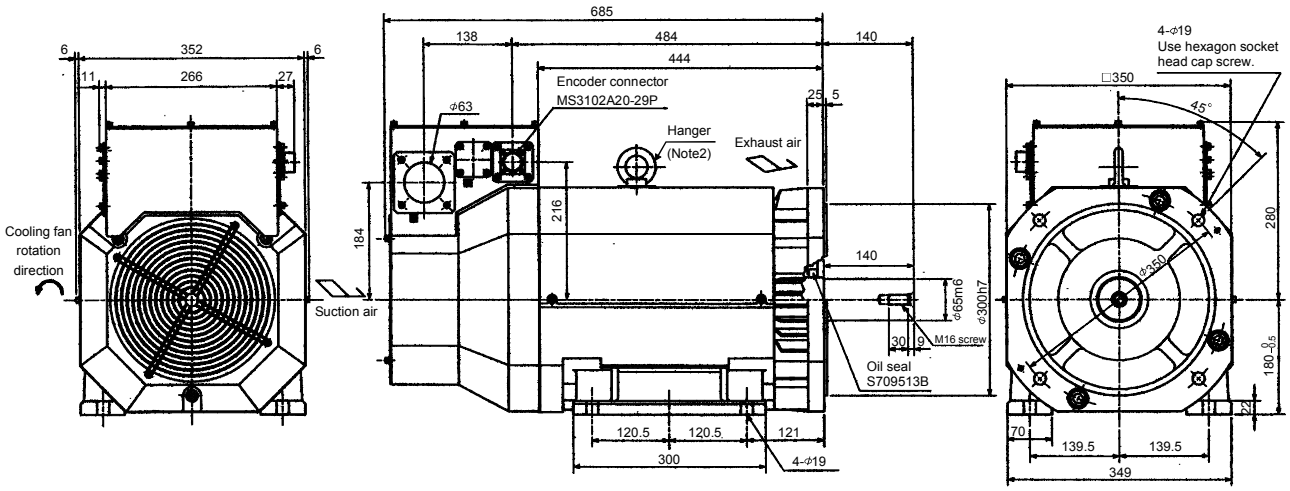
Note:1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC11107A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LF55K24	55	1310	250

(Note1)[Unit: mm]

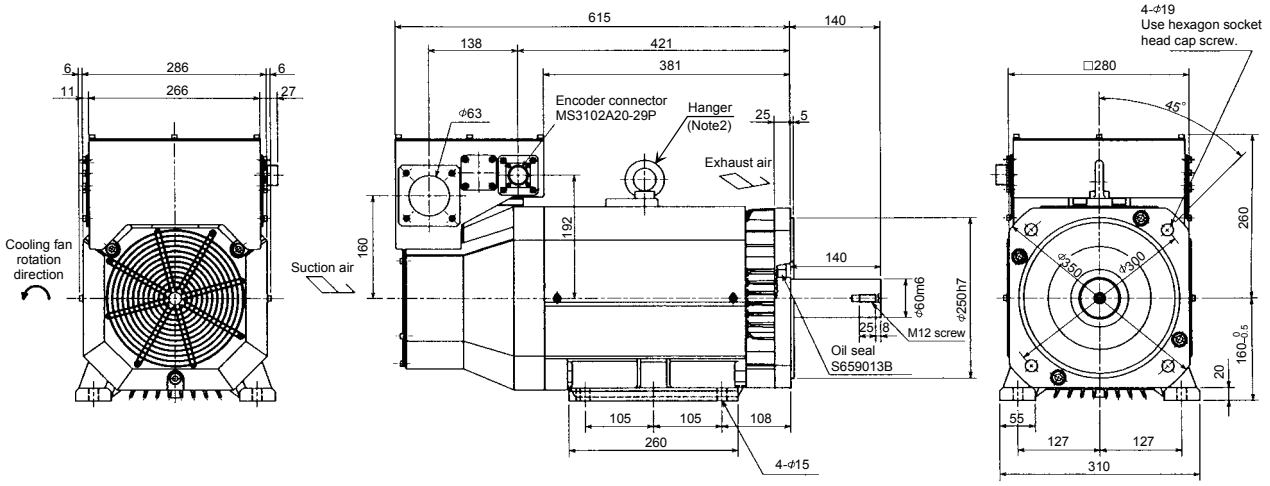


Note: 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10522F

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LF30K2	30	550	160

(Note1)[Unit: mm]



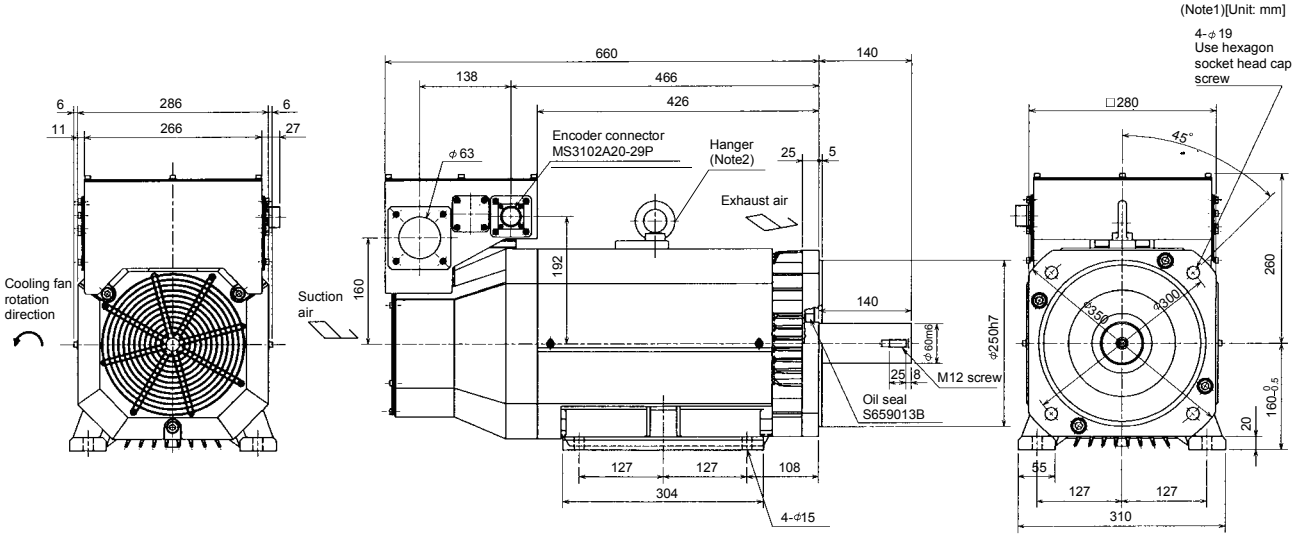
Note: 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC12180*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Mass [kg]
HA-LF37K2	37	650	180

(Note1)[Unit: mm]



Note: 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16× 20 mm or less.

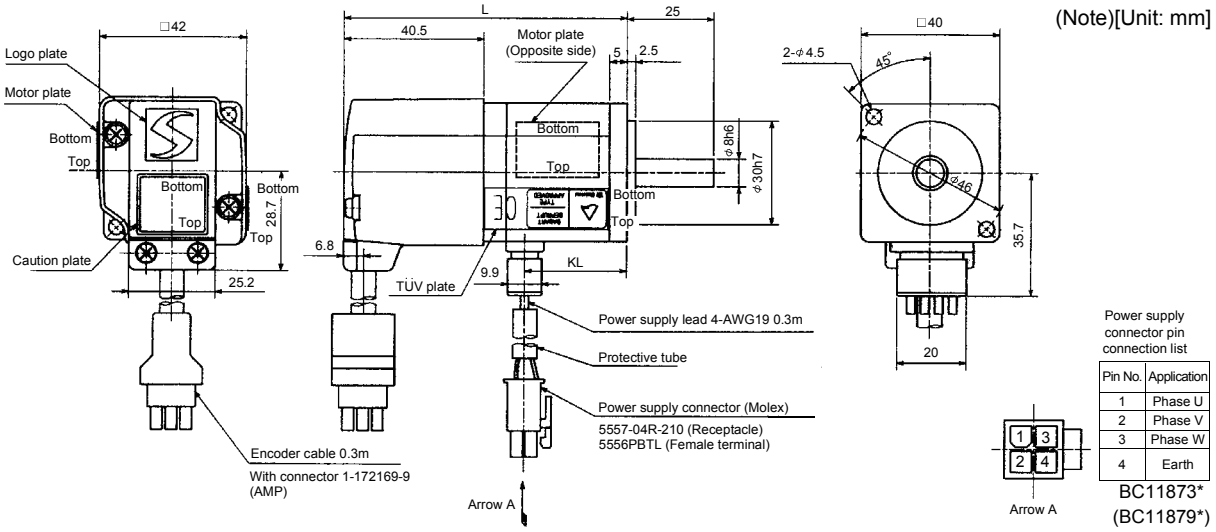
BC12181*

7.1.11 HC-MFS・HC-KFS series

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS053	50	81.5	29.5	0.019	0.40
HC-MFS13	100	96.5	44.5	0.03	0.53
HC-KFS053	50	81.5	29.5	0.053	0.40
HC-KFS13	100	96.5	44.5	0.084	0.53

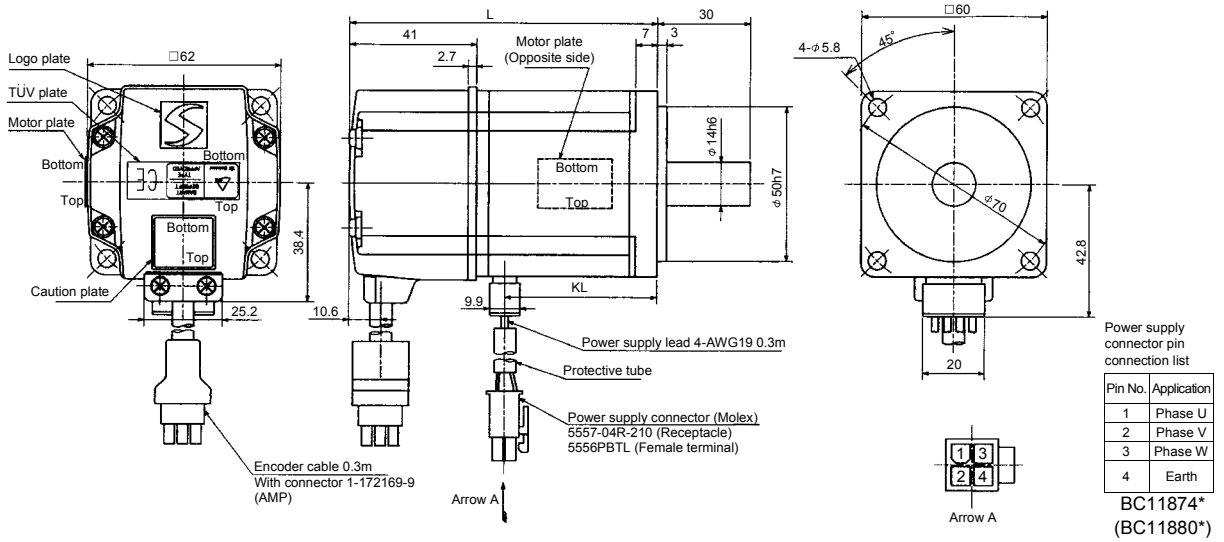
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS23	200	99.5	49.1	0.088	0.99
HC-MFS43	400	124.5	72.1	0.143	1.45
HC-KFS23	200	99.5	49.1	0.42	0.99
HC-KFS43	400	124.5	72.1	0.67	1.45

(Note)[Unit: mm]

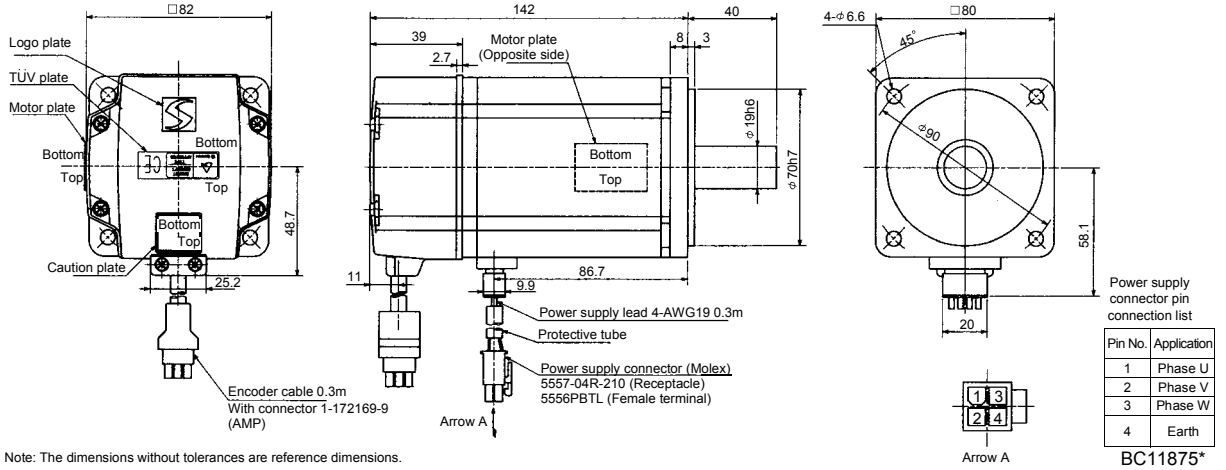


Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS73	750	0.6	3
HC-KFS73	750	1.51	3

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Power supply connector pin connection list

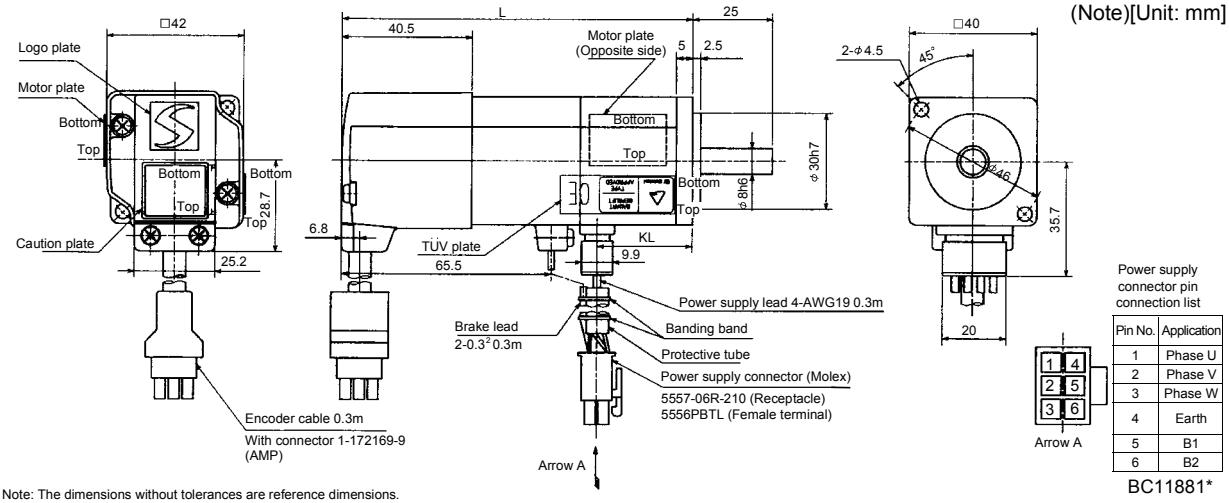
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11875*
(BC12580*)

(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-MFS053B	50	109.5	29.5	0.32	0.022	0.75
HC-MFS13B	100	124.5	44.5	0.32	0.032	0.89
HC-KFS053B	50	109.5	29.5	0.32	0.056	0.75
HC-KFS13B	100	124.5	44.5	0.32	0.087	0.89

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

Power supply connector pin connection list

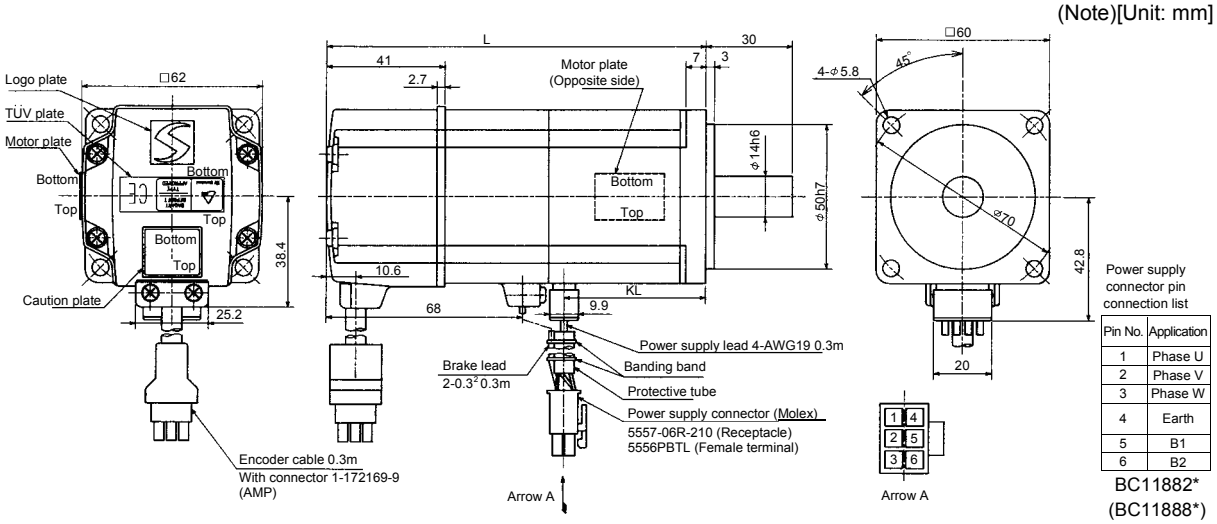
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11881*
(BC11887*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-MFS23B	200	131.5	49.1	1.3	0.136	1.6
HC-MFS43B	400	156.5	72.1	1.3	0.191	2.1
HC-KFS23B	200	131.5	49.1	1.3	0.310	1.6
HC-KFS43B	400	156.5	72.1	1.3	0.510	2.1

(Note)[Unit: mm]

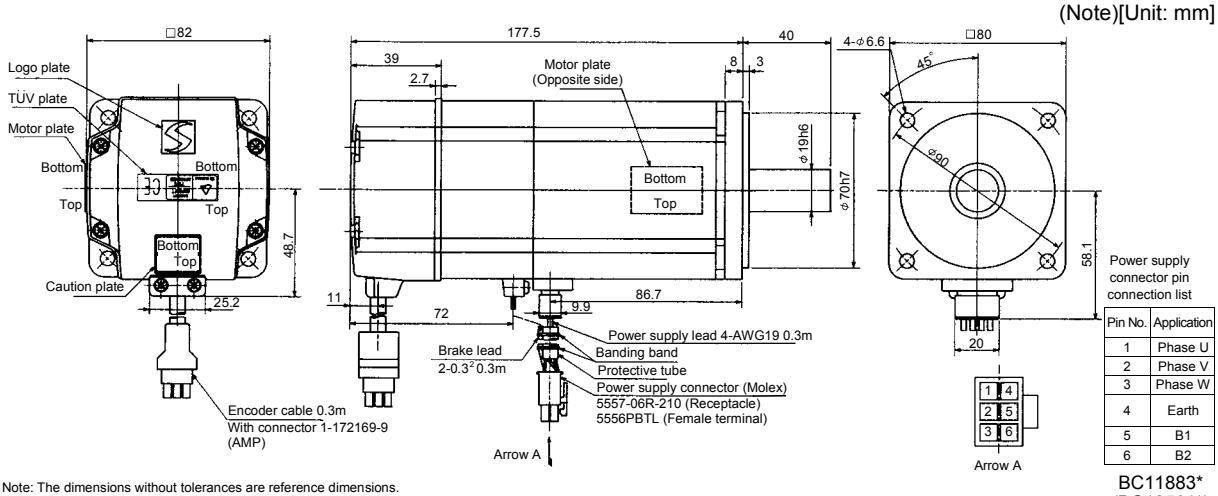


BC11882*
(BC11888*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS73B	750	2.4	0.725	4.0
HC-KFS73B	750	2.4	1.635	4.0

(Note)[Unit: mm]



BC11883*
(BC12581*)

Note: The dimensions without tolerances are reference dimensions.

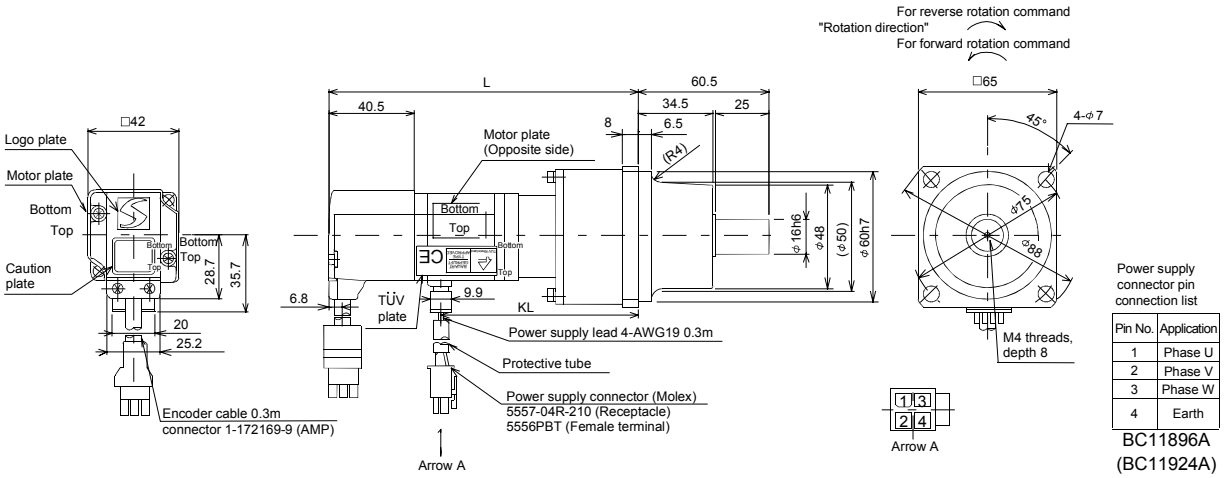
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS053G1	50	126	74	K6505	1/5(9/44)	0.055	60min. max.	1.4
HC-MFS053G1	50	144	92	K6512	1/12(49/576)	0.077	60min. max.	1.8
HC-MFS053G1	50	144	92	K6520	1/20(25/484)	0.059	60min. max.	1.8
HC-KFS053G1	50	126	74	K6505	1/5(9/44)	0.090	60min. max.	1.4
HC-KFS053G1	50	144	92	K6512	1/12(49/576)	0.112	60min. max.	1.8
HC-KFS053G1	50	144	92	K6520	1/20(25/484)	0.094	60min. max.	1.8

(Note)[Unit: mm]

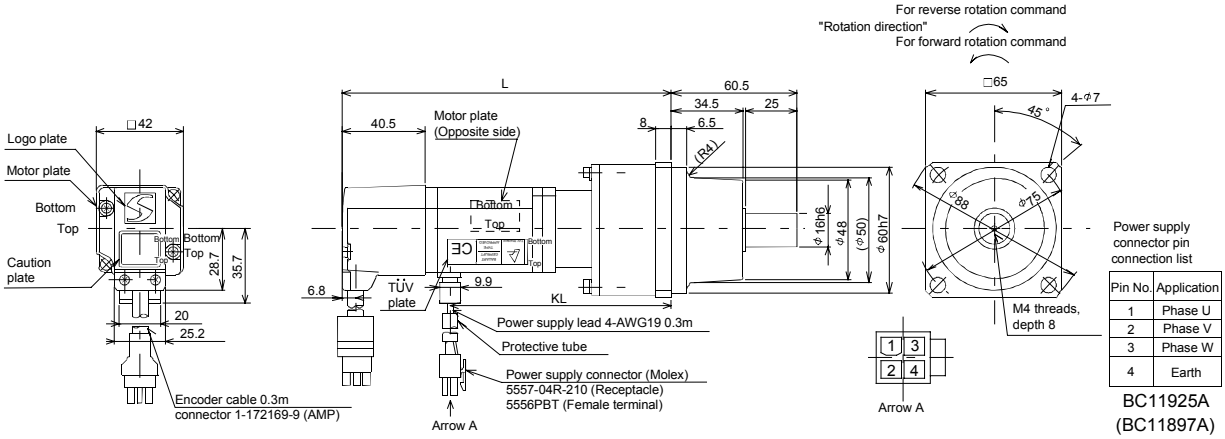


BC11896A
(BC11924A)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS13G1	100	141	89	K6505	1/5(9/44)	0.067	60min. max.	1.5
HC-MFS13G1	100	159	107	K6512	1/12(49/576)	0.089	60min. max.	1.9
HC-MFS13G1	100	159	107	K6520	1/20(25/484)	0.071	60min. max.	1.9
HC-KFS13G1	100	141	89	K6505	1/5(9/44)	0.121	60min. max.	1.5
HC-KFS13G1	100	159	107	K6512	1/12(49/576)	0.143	60min. max.	1.9
HC-KFS13G1	100	159	107	K6520	1/20(25/484)	0.125	60min. max.	1.9

(Note)[Unit: mm]



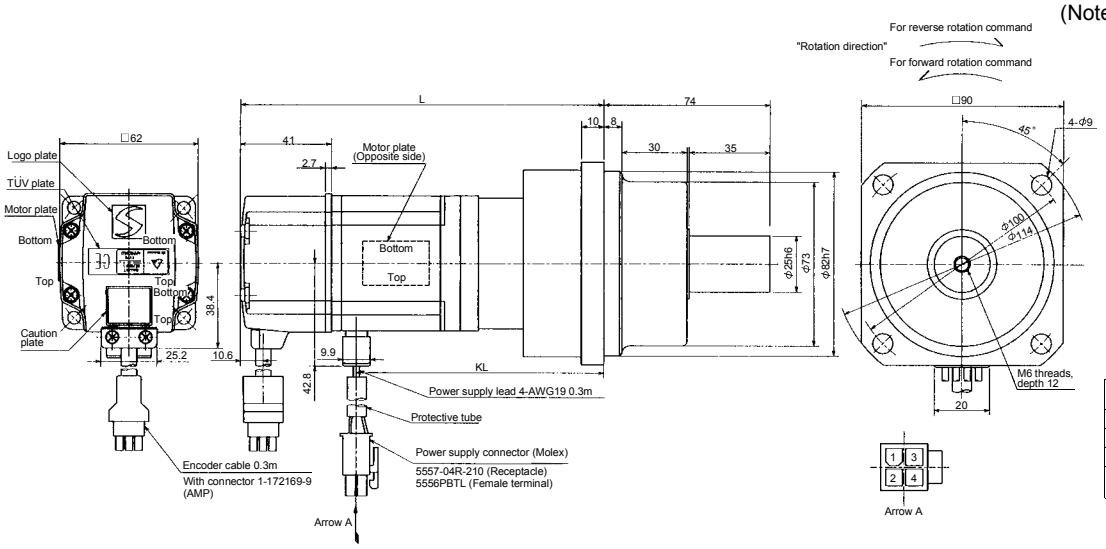
BC11925A
(BC11897A)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS23G1	200	153	102.6	K9005	1/5(19/96)	0.249	3.3
HC-MFS23G1	200	173	122.6	K9012	1/12(25/288)	0.293	3.9
HC-MFS23G1	200	173	122.6	K9020	1/20(253/5000)	0.266	3.9
HC-KFS23G1	200	153	102.6	K9005	1/5(19/96)	0.420	3.3
HC-KFS23G1	200	173	122.6	K9012	1/12(25/288)	0.470	3.9
HC-KFS23G1	200	173	122.6	K9020	1/20(253/5000)	0.440	3.9

(Note)[Unit: mm]



Power supply connector pin connection list

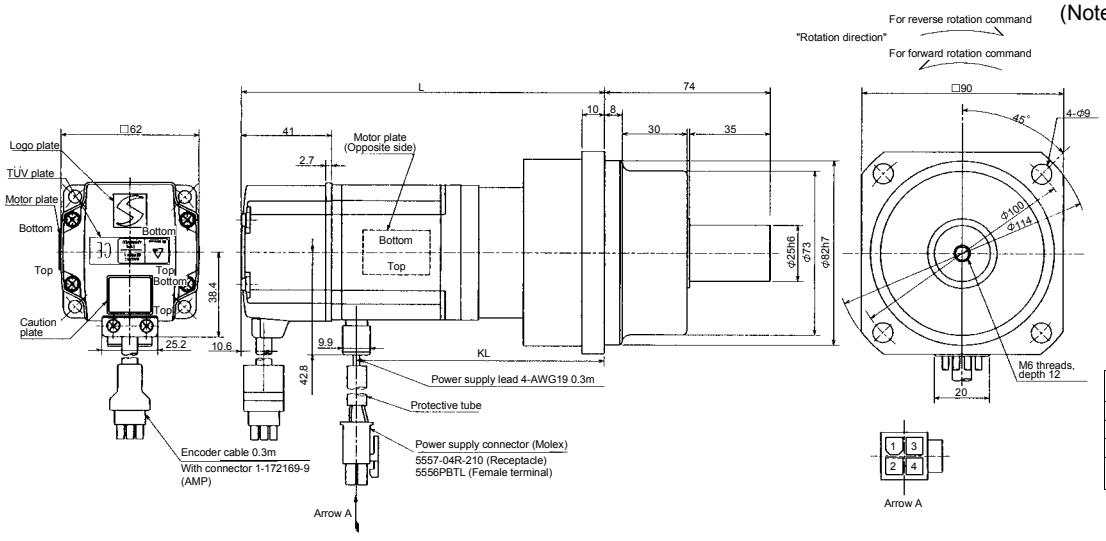
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11898*
(BC11926*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS43G1	400	178	125.6	K9005	1/5(19/96)	0.296	3.8
HC-MFS43G1	400	198	145.6	K9012	1/12(25/288)	0.339	4.4
HC-KFS43G1	400	178	125.6	K9005	1/5(19/96)	0.610	3.8
HC-KFS43G1	400	198	145.6	K9012	1/12(25/288)	0.660	4.4

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11899*
(BC11927*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

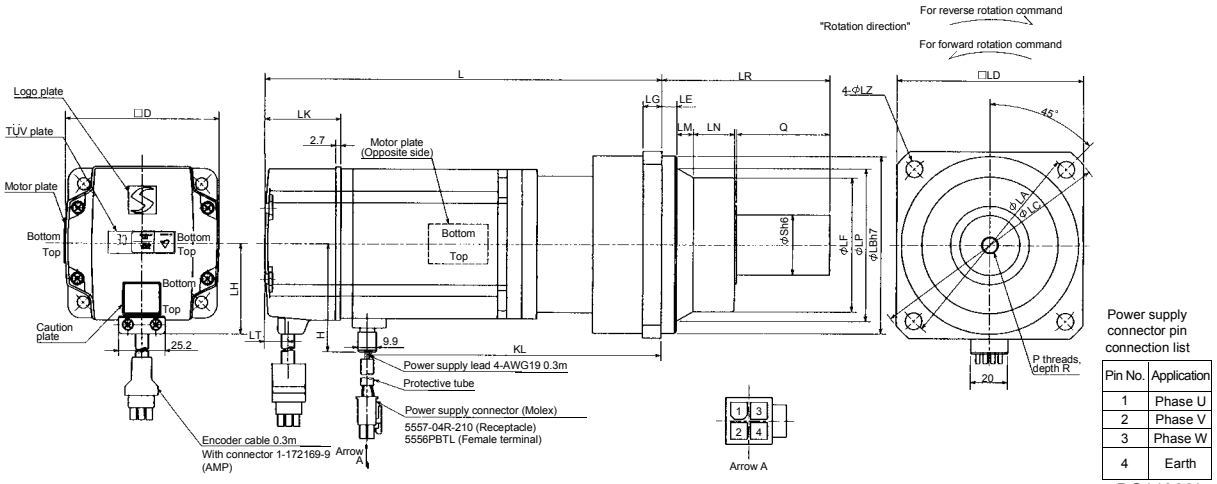
Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-MFS43G1	400	K10020	1/20	253/5000	0.653	60min. max.	5.5
HC-MFS73G1	750	K10005	1/5	1/5	1.02	60min. max.	6.2
HC-MFS73G1	750	K10012	1/12	525/6048	1.686	60min. max.	7.3
HC-MFS73G1	750	K12020	1/20	625/12544	1.75	60min. max.	10.1

Model	Output [W]	Variable Dimensions																					
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MFS43G1	400	62	38.4	41	10.6	42.8	115	95	132	100	10	73	10	13	16	86	201.5	90	149.1	9	50	32	M8	16
HC-MFS73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	207	90	151.7	9	50	32	M8	16
HC-MFS73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	229	90	173.7	9	50	32	M8	16
HC-MFS73G1	750	82	48.7	39	11	58.1	140	115	162	120	12	90	15	13	20	104	242	106	186.7	14	60	40	M10	20

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-KFS43G1	400	K10020	1/20	253/5000	0.970	60min. max.	5.5
HC-KFS73G1	750	K10005	1/5	1/5	1.930	60min. max.	6.2
HC-KFS73G1	750	K10012	1/12	525/6048	2.596	60min. max.	7.3
HC-KFS73G1	750	K12020	1/20	625/12544	2.660	60min. max.	10.1

Model	Output [W]	Variable Dimensions																					
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-KFS43G1	400	62	38.4	41	10.6	42.8	115	95	132	100	10	73	10	13	16	86	201.5	90	149.1	9	50	32	M8	16
HC-KFS73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	207	90	151.7	9	50	32	M8	16
HC-KFS73G1	750	82	48.7	39	11	58.1	115	95	132	100	10	73	10	13	16	86	229	90	173.7	9	50	32	M8	16
HC-KFS73G1	750	82	48.7	39	11	58.1	140	115	162	120	12	90	15	13	20	104	242	106	186.7	14	60	40	M10	20

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

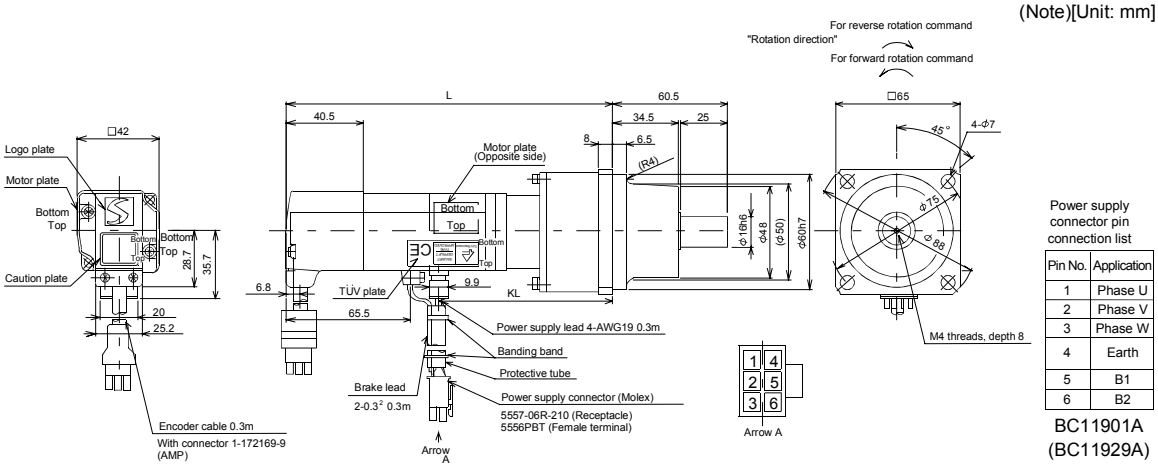
BC11900*
(********)

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS053BG1	50	154	74	0.32	K6505	1/5(9/44)	0.058	60min. max.	1.8
HC-MFS053BG1	50	172	92	0.32	K6512	1/12(49/576)	0.080	60min. max.	2.2
HC-MFS053BG1	50	172	92	0.32	K6520	1/20(25/484)	0.062	60min. max.	2.2
HC-KFS053BG1	50	154	74	0.32	K6505	1/5(9/44)	0.093	60min. max.	1.8
HC-KFS053BG1	50	172	92	0.32	K6512	1/12(49/576)	0.115	60min. max.	2.2
HC-KFS053BG1	50	172	92	0.32	K6520	1/20(25/484)	0.097	60min. max.	2.2

(Note)[Unit: mm]



Power supply connector pin connection list

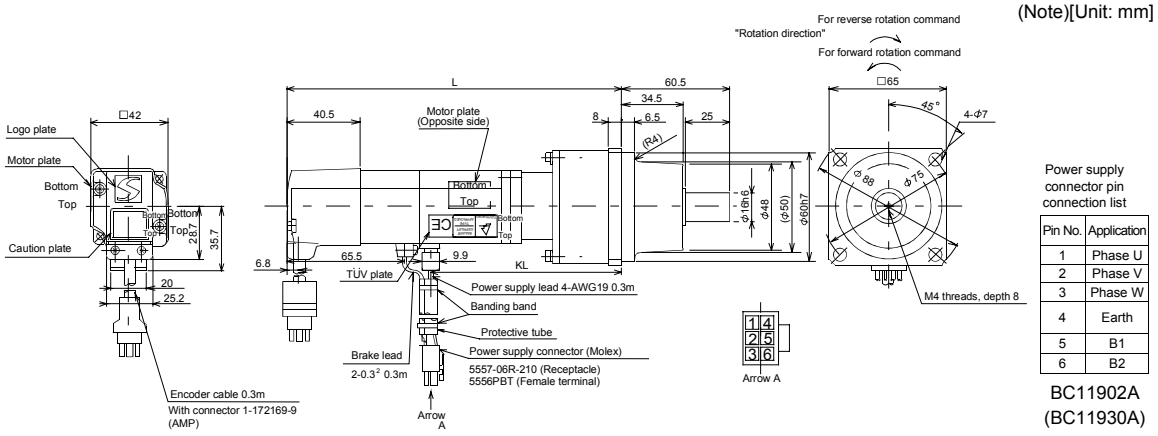
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11901A
(BC11929A)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS13BG1	100	169	89	0.32	K6505	1/5(9/44)	0.069	60min. max.	1.9
HC-MFS13BG1	100	187	107	0.32	K6512	1/12(49/576)	0.091	60min. max.	2.3
HC-MFS13BG1	100	187	107	0.32	K6520	1/20(25/484)	0.073	60min. max.	2.3
HC-KFS13BG1	100	169	89	0.32	K6505	1/5(9/44)	0.124	60min. max.	1.9
HC-KFS13BG1	100	187	107	0.32	K6512	1/12(49/576)	0.146	60min. max.	2.3
HC-KFS13BG1	100	187	107	0.32	K6520	1/20(25/484)	0.128	60min. max.	2.3

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

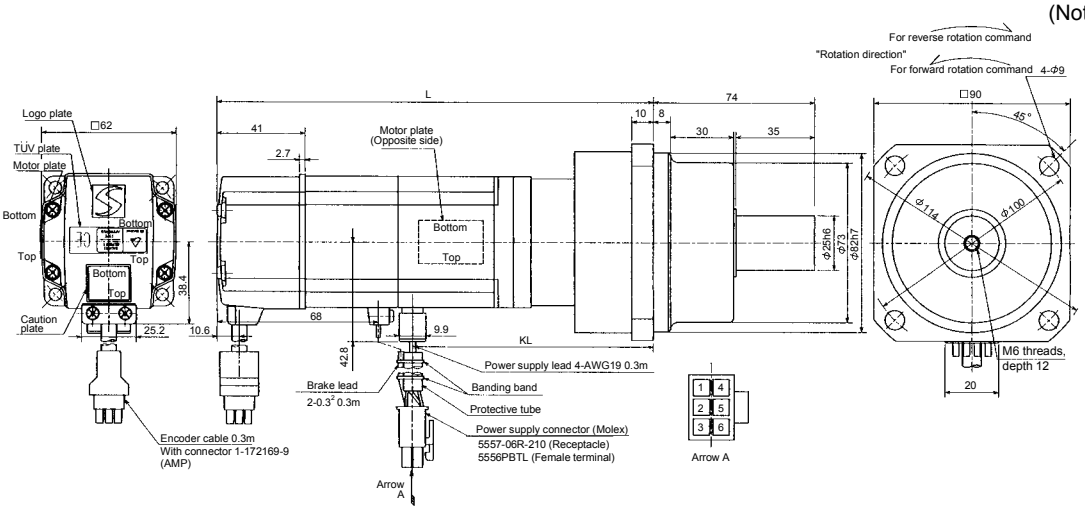
BC11902A
(BC11930A)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
		L	KL					
HC-MFS23BG1	200	185	102.6	K9005	1/5(19/96)	0.289	3.9	1.3
HC-MFS23BG1	200	205	122.6	K9012	1/12(25/288)	0.333	4.5	1.3
HC-MFS23BG1	200	205	122.6	K9020	1/20(253/5000)	0.306	4.5	1.3
HC-KFS23BG1	200	185	102.6	K9005	1/5(19/96)	0.470	3.9	1.3
HC-KFS23BG1	200	205	122.6	K9012	1/12(25/288)	0.520	4.5	1.3
HC-KFS23BG1	200	205	122.6	K9020	1/20(253/5000)	0.490	4.5	1.3

(Note)[Unit: mm]



Power supply connector pin connection list

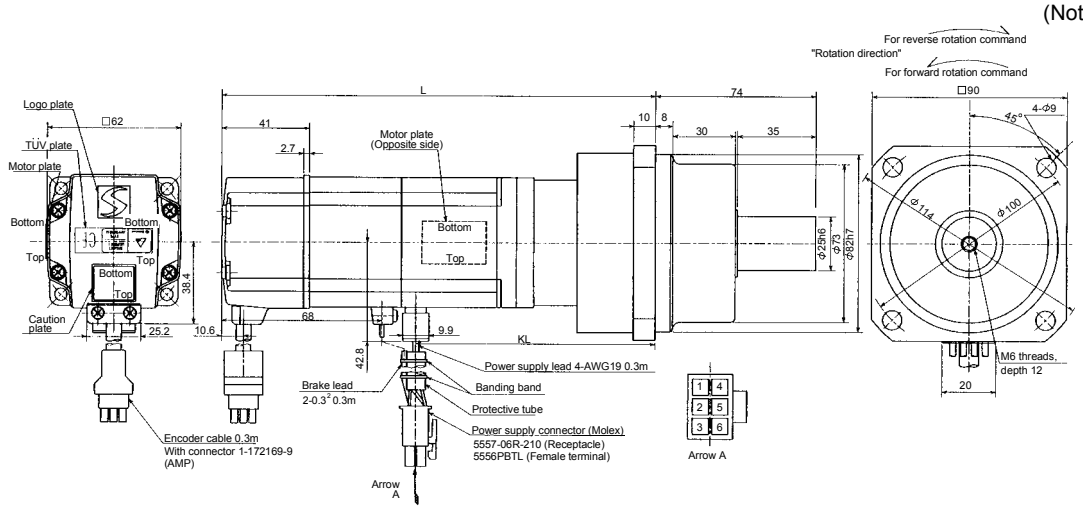
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11903*
(BC11931*)

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
		L	KL					
HC-MFS43BG1	400	210	125.6	K9005	1/5(19/96)	0.344	4.4	1.3
HC-MFS43BG1	400	230	145.6	K9012	1/12(25/288)	0.388	5.0	1.3
HC-KFS43BG1	400	210	125.6	K9005	1/5(19/96)	0.660	4.4	1.3
HC-KFS43BG1	400	230	145.6	K9012	1/12(25/288)	0.710	5.0	1.3

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11904*
(BC11932*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

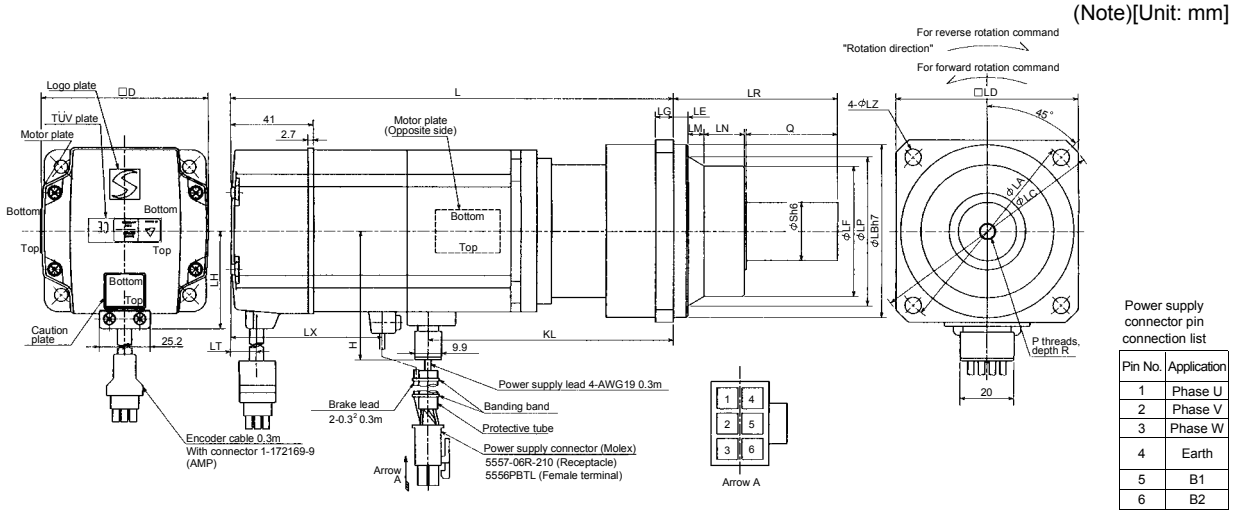
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-MFS43BG1	400	1.3	K10020	1/20	253/5000	0.700	60min. max.	6.1
HC-MFS73BG1	750	2.4	K10005	1/5	1/5	1.145	60min. max.	7.2
HC-MFS73BG1	750	2.4	K10012	1/12	525/6048	1.811	60min. max.	8.3
HC-MFS73BG1	750	2.4	K12020	1/20	625/12544	1.875	60min. max.	11.1

Model	Output [W]	Variable Dimensions																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MFS43BG1	400	62	38.4	41	10.6	68	42.8	115	95	132	100	10	73	10	13	16	86	233.5	90	149.1	9	50	32	M8	16
HC-MFS73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	242.5	90	151.7	9	50	32	M8	16
HC-MFS73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	264.5	90	173.7	9	50	32	M8	16
HC-MFS73BG1	750	82	48.7	39	11	72	58.1	140	115	162	120	12	90	15	13	20	104	277.5	106	186.7	14	60	40	M10	20

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio		Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-KFS43BG1	400	1.3	K10020	1/20	253/5000	1.02	60min. max.	6.1
HC-KFS73BG1	750	2.4	K10005	1/5	1/5	2.055	60min. max.	7.2
HC-KFS73BG1	750	2.4	K10012	1/12	525/6048	2.721	60min. max.	8.3
HC-KFS73BG1	750	2.4	K12020	1/20	625/12544	2.785	60min. max.	11.1

Model	Output [W]	Variable Dimensions																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-KFS43BG1	400	62	38.4	41	10.6	68	42.8	115	95	132	100	10	73	10	13	16	86	233.5	90	149.1	9	50	32	M8	16
HC-KFS73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	242.5	90	151.7	9	50	32	M8	16
HC-KFS73BG1	750	82	48.7	39	11	72	58.1	115	95	132	100	10	73	10	13	16	86	264.5	90	173.7	9	50	32	M8	16
HC-KFS73BG1	750	82	48.7	39	11	72	58.1	140	115	162	120	12	90	15	13	20	104	277.5	106	186.7	14	60	40	M10	20

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

Note: The dimensions without tolerances are reference dimensions.

BC11905*
(********)

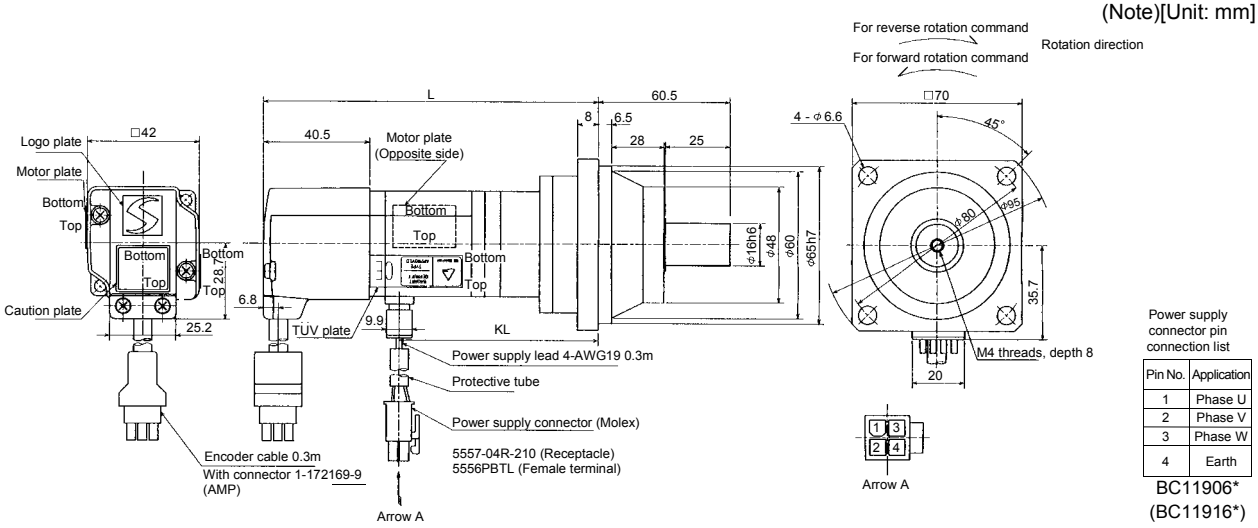
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 1 to 3mm larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions L	Variable Dimensions KL	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS053G2	50	130	78	BK1-05B-A5MEKA	1/5	0.067	3 min. max.	1.4
HC-MFS053G2	50	146	94	BK1-09B-A5MEKA	1/9	0.060	3 min. max.	1.7
HC-MFS053G2	50	146	94	BK1-20B-A5MEKA	1/20	0.069	3 min. max.	1.8
HC-MFS053G2	50	146	94	BK1-29B-A5MEKA	1/29	0.057	3 min. max.	1.8
HC-KFS053G2	50	130	78	BK1-05B-A5MEKA	1/5	0.101	3 min. max.	1.4
HC-KFS053G2	50	146	94	BK1-09B-A5MEKA	1/9	0.095	3 min. max.	1.7
HC-KFS053G2	50	146	94	BK1-20B-A5MEKA	1/20	0.104	3 min. max.	1.8
HC-KFS053G2	50	146	94	BK1-29B-A5MEKA	1/29	0.092	3 min. max.	1.8

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11906*
(BC11916*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

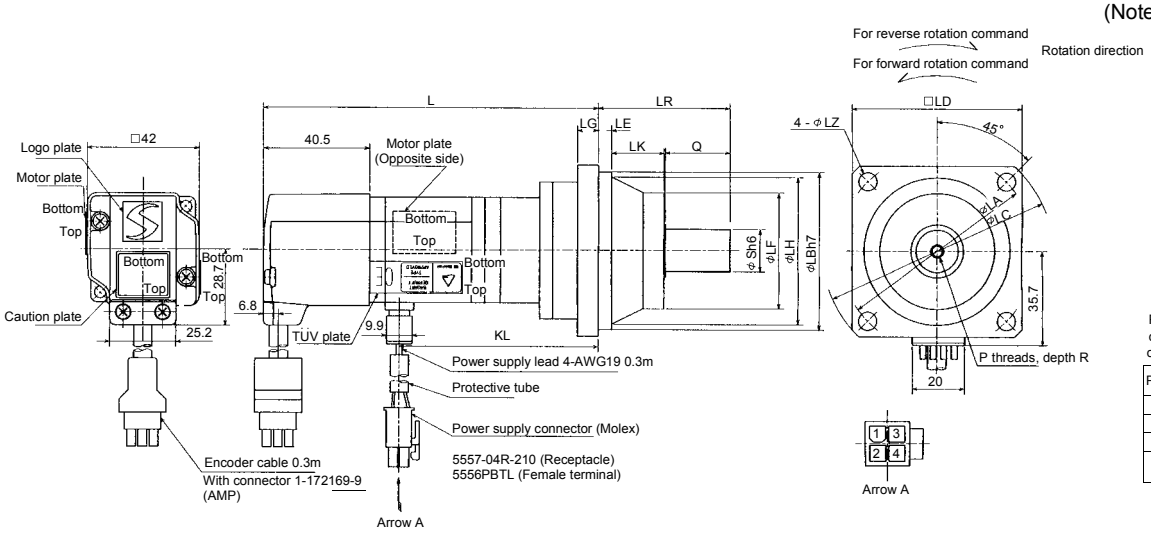
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS13G2	100	BK1-05B-01MEKA	1/5	0.078	3 min. max.	1.5
HC-MFS13G2	100	BK1-09B-01MEKA	1/9	0.072	3 min. max.	1.8
HC-MFS13G2	100	BK2-20B-01MEKA	1/20	0.122	3 min. max.	3.0
HC-MFS13G2	100	BK2-29B-01MEKA	1/29	0.096	3 min. max.	3.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS13G2	100	80	65	95	70	6	48	8	60	23	145	55	93	6.6	25	16	M4	8
HC-MFS13G2	100	80	65	95	70	6	48	8	60	23	161	55	109	6.6	25	16	M4	8
HC-MFS13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10
HC-MFS13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-KFS13G2	100	BK1-05B-01MEKA	1/5	0.132	3 min. max.	1.5
HC-KFS13G2	100	BK1-09B-01MEKA	1/9	0.126	3 min. max.	1.8
HC-KFS13G2	100	BK2-20B-01MEKA	1/20	0.176	3 min. max.	3.0
HC-KFS13G2	100	BK2-29B-01MEKA	1/29	0.150	3 min. max.	3.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS13G2	100	80	65	95	70	6	48	8	60	23	145	55	93	6.6	25	16	M4	8
HC-KFS13G2	100	80	65	95	70	6	48	8	60	23	161	55	109	6.6	25	16	M4	8
HC-KFS13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10
HC-KFS13G2	100	100	80	115	85	6	65	10	74	33	167	75	115	6.6	35	20	M5	10

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11907*
(BC11917*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

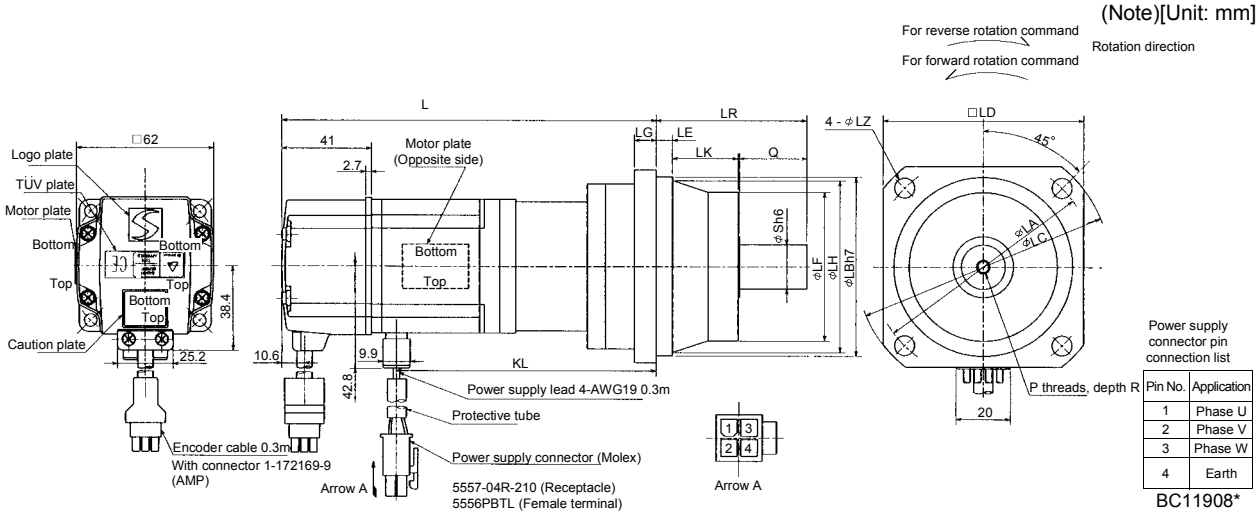
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS23G2	200	BK1-05B-02MEKA	1/5	0.191	2.1
HC-MFS23G2	200	BK2-09B-02MEKA	1/9	0.208	3.5
HC-MFS23G2	200	BK3-20B-02MEKA	1/20	0.357	5.0
HC-MFS23G2	200	BK3-29B-02MEKA	1/29	0.276	5.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS23G2	200	80	65	95	70	6	48	8	60	23	157	55	106.6	6.6	25	16	M4	8
HC-MFS23G2	200	100	80	115	85	6	65	10	74	33	175	75	124.6	6.6	35	20	M5	10
HC-MFS23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12
HC-MFS23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS23G2	200	BK1-05B-02MEKA	1/5	0.360	2.1
HC-KFS23G2	200	BK2-09B-02MEKA	1/9	0.380	3.5
HC-KFS23G2	200	BK3-20B-02MEKA	1/20	0.530	5.0
HC-KFS23G2	200	BK3-29B-02MEKA	1/29	0.450	5.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS23G2	200	80	65	95	70	6	48	8	60	23	157	55	106.6	6.6	25	16	M4	8
HC-KFS23G2	200	100	80	115	85	6	65	10	74	33	175	75	124.6	6.6	35	20	M5	10
HC-KFS23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12
HC-KFS23G2	200	115	95	135	100	8	75	10	85	35	180	85	129.6	9	40	25	M6	12

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11908*
(BC11918*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

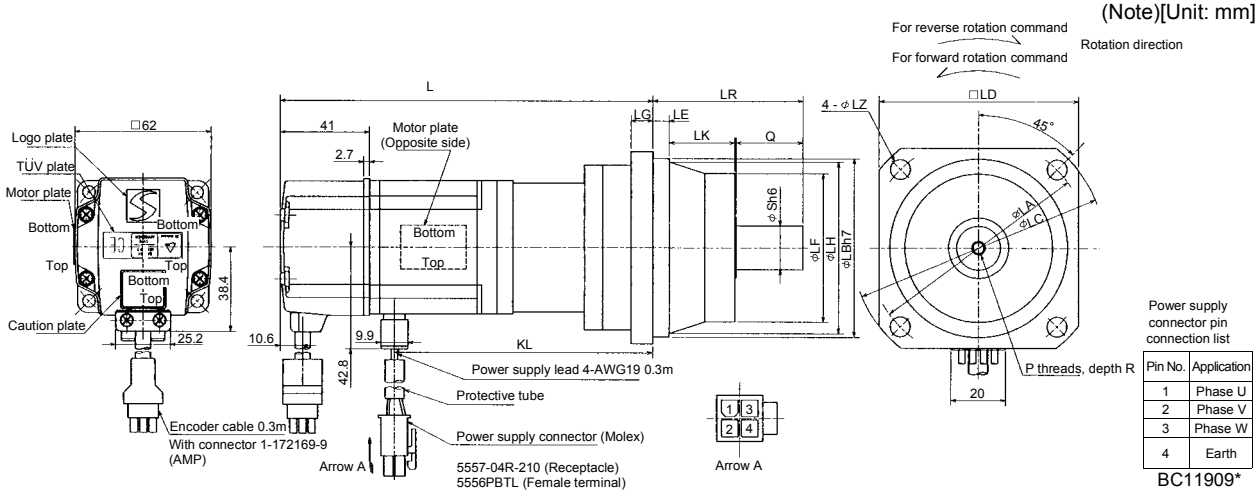
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS43G2	400	BK2-05B-04MEKA	1/5	0.295	3.7
HC-MFS43G2	400	BK3-09B-04MEKA	1/9	0.323	5.3
HC-MFS43G2	400	BK4-20B-04MEKA	1/20	0.426	7.5
HC-MFS43G2	400	BK4-29B-04MEKA	1/29	0.338	7.5

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS43G2	400	100	80	115	85	6	65	10	74	33	184	75	131.6	6.6	35	20	M5	10
HC-MFS43G2	400	115	95	135	100	8	75	10	85	35	205	85	152.6	9	40	25	M6	12
HC-MFS43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16
HC-MFS43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS43G2	400	BK2-05B-04MEKA	1/5	0.610	3.7
HC-KFS43G2	400	BK3-09B-04MEKA	1/9	0.640	5.3
HC-KFS43G2	400	BK4-20B-04MEKA	1/20	0.740	7.5
HC-KFS43G2	400	BK4-29B-04MEKA	1/29	0.660	7.5

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS43G2	400	100	80	115	85	6	65	10	74	33	184	75	131.6	6.6	35	20	M5	10
HC-KFS43G2	400	115	95	135	100	8	75	10	85	35	205	85	152.6	9	40	25	M6	12
HC-KFS43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16
HC-KFS43G2	400	135	110	155	115	8	90	12	100	40	211	100	158.6	11	50	32	M8	16

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11909*
(BC11919*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

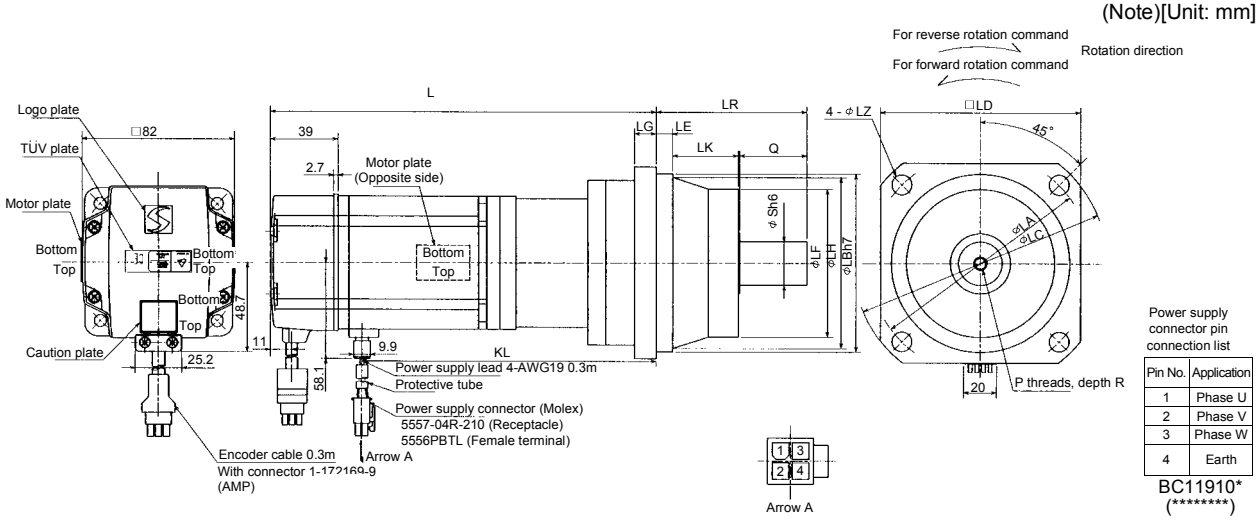
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS73G2	750	BK3-05B-08MEKA	1/5	0.973	6.3
HC-MFS73G2	750	BK4-09B-08MEKA	1/9	0.980	8.6
HC-MFS73G2	750	BK5-20B-08MEKA	1/20	1.016	12.0
HC-MFS73G2	750	BK5-29B-08MEKA	1/29	0.910	12.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS73G2	750	115	95	135	100	8	75	10	85	35	212	85	156.7	9	40	25	M6	12
HC-MFS73G2	750	135	110	155	115	8	90	12	100	40	240	100	184.7	11	50	32	M8	16
HC-MFS73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20
HC-MFS73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS73G2	750	BK3-05B-08MEKA	1/5	1.883	6.3
HC-KFS73G2	750	BK4-09B-08MEKA	1/9	1.890	8.6
HC-KFS73G2	750	BK5-20B-08MEKA	1/20	1.926	12.0
HC-KFS73G2	750	BK5-29B-08MEKA	1/29	1.820	12.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS73G2	750	115	95	135	100	8	75	10	85	35	212	85	156.7	9	40	25	M6	12
HC-KFS73G2	750	135	110	155	115	8	90	12	100	40	240	100	184.7	11	50	32	M8	16
HC-KFS73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20
HC-KFS73G2	750	150	125	175	130	10	105	15	115	43	248	115	192.7	14	60	40	M10	20

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

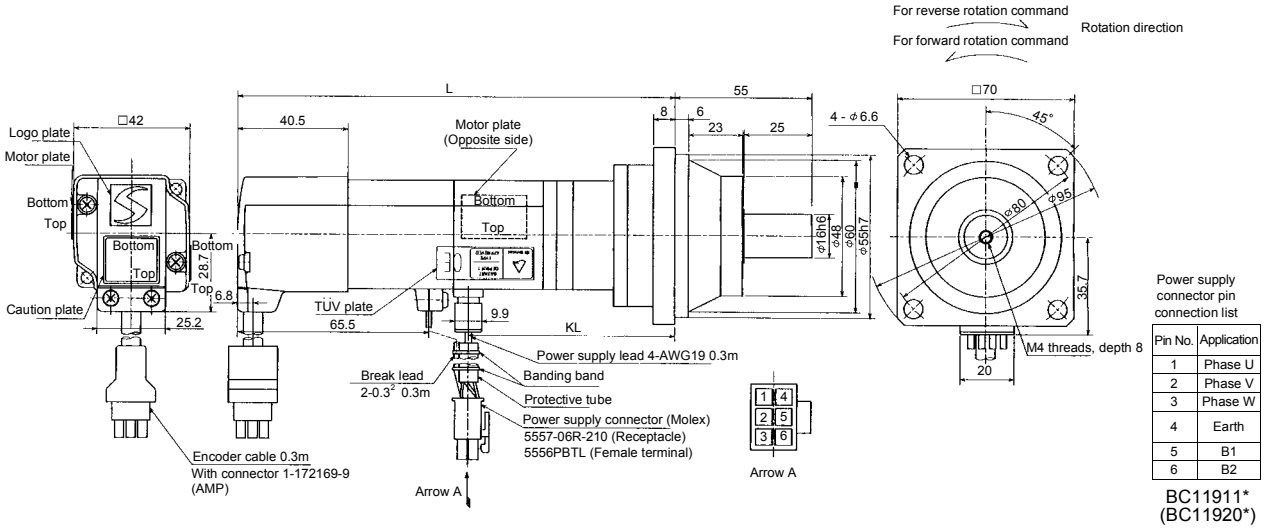
BC11910*
(********)

Note: The dimensions without tolerances are reference dimensions.

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[$\times 10^{-4}$kg・m^2]	Backlash	Mass [kg]
		L	KL						
HC-MFS053BG2	50	158	78	0.32	BK1-05B-A5MEKA	1/5	0.070	3 min. max.	1.8
HC-MFS053BG2	50	174	94	0.32	BK1-09B-A5MEKA	1/9	0.063	3 min. max.	2.1
HC-MFS053BG2	50	174	94	0.32	BK1-20B-A5MEKA	1/20	0.072	3 min. max.	2.2
HC-MFS053BG2	50	174	94	0.32	BK1-29B-A5MEKA	1/29	0.060	3 min. max.	2.2
HC-KFS053BG2	50	158	78	0.32	BK1-05B-A5MEKA	1/5	0.104	3 min. max.	1.8
HC-KFS053BG2	50	174	94	0.32	BK1-09B-A5MEKA	1/9	0.098	3 min. max.	2.1
HC-KFS053BG2	50	174	94	0.32	BK1-20B-A5MEKA	1/20	0.107	3 min. max.	2.2
HC-KFS053BG2	50	174	94	0.32	BK1-29B-A5MEKA	1/29	0.095	3 min. max.	2.2

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11911*
(BC11920*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

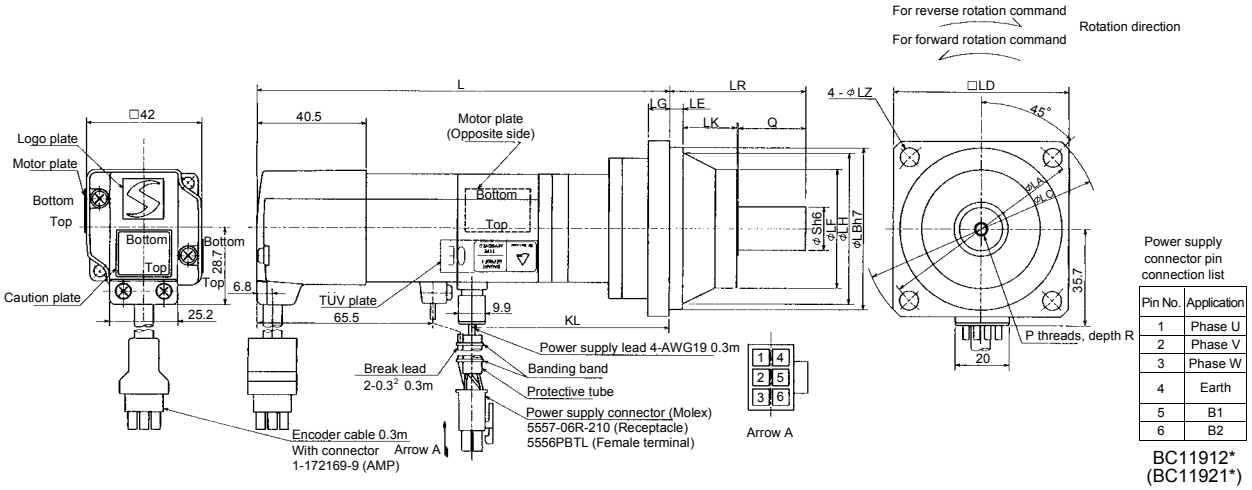
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-MFS13BG2	100	0.32	BK1-05B-01MEKA	1/5	0.080	3 min. max.	1.9
HC-MFS13BG2	100	0.32	BK1-09B-01MEKA	1/9	0.074	3 min. max.	2.2
HC-MFS13BG2	100	0.32	BK2-20B-01MEKA	1/20	0.124	3 min. max.	3.4
HC-MFS13BG2	100	0.32	BK2-29B-01MEKA	1/29	0.098	3 min. max.	3.4

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS13BG2	100	80	65	95	70	6	48	8	60	23	173	55	93	6.6	25	16	M4	8
HC-MFS13BG2	100	80	65	95	70	6	48	8	60	23	189	55	109	6.6	25	16	M4	8
HC-MFS13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10
HC-MFS13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Backlash	Mass [kg]
HC-KFS13BG2	100	0.32	BK1-05B-01MEKA	1/5	0.135	3 min. max.	1.9
HC-KFS13BG2	100	0.32	BK1-09B-01MEKA	1/9	0.129	3 min. max.	2.2
HC-KFS13BG2	100	0.32	BK2-20B-01MEKA	1/20	0.179	3 min. max.	3.4
HC-KFS13BG2	100	0.32	BK2-29B-01MEKA	1/29	0.153	3 min. max.	3.4

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS13BG2	100	80	65	95	70	6	48	8	60	23	173	55	93	6.6	25	16	M4	8
HC-KFS13BG2	100	80	65	95	70	6	48	8	60	23	189	55	109	6.6	25	16	M4	8
HC-KFS13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10
HC-KFS13BG2	100	100	80	115	85	6	65	10	74	33	195	75	115	6.6	35	20	M5	10

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11912*
(BC11921*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

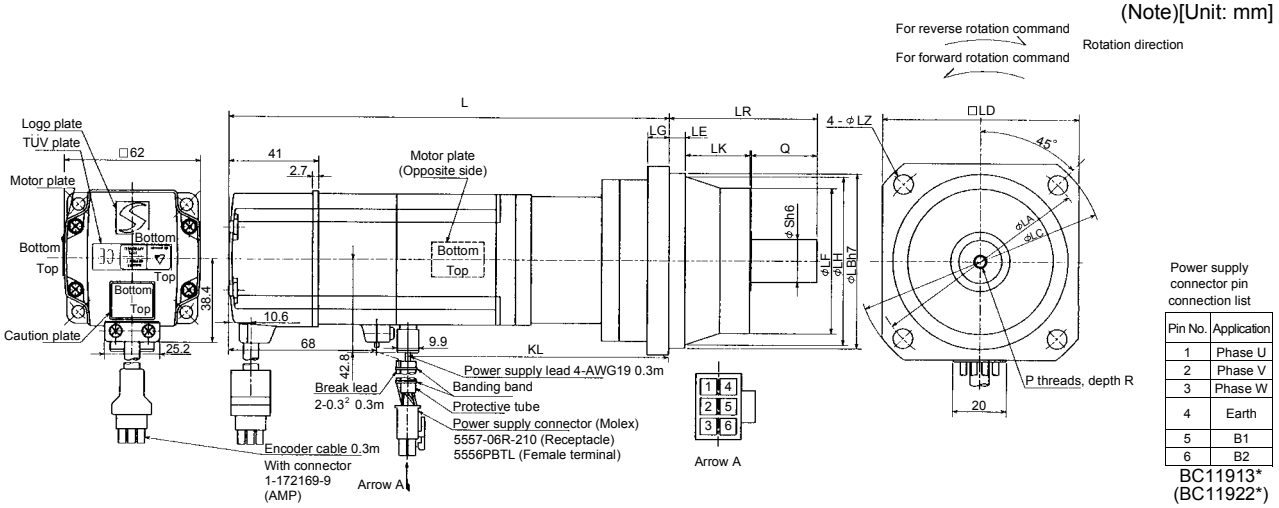
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS23BG2	200	1.3	BK1-05B-02MEKA	1/5	0.239	2.7
HC-MFS23BG2	200	1.3	BK2-09B-02MEKA	1/9	0.256	4.1
HC-MFS23BG2	200	1.3	BK3-20B-02MEKA	1/20	0.405	5.6
HC-MFS23BG2	200	1.3	BK3-29B-02MEKA	1/29	0.324	5.6

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS23BG2	200	80	65	95	70	6	48	8	60	23	189	55	106.6	6.6	25	16	M4	8
HC-MFS23BG2	200	100	80	115	85	6	65	10	74	33	207	75	124.6	6.6	35	20	M5	10
HC-MFS23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12
HC-MFS23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS23BG2	200	1.3	BK1-05B-02MEKA	1/5	0.410	2.7
HC-KFS23BG2	200	1.3	BK2-09B-02MEKA	1/9	0.430	4.1
HC-KFS23BG2	200	1.3	BK3-20B-02MEKA	1/20	0.580	5.6
HC-KFS23BG2	200	1.3	BK3-29B-02MEKA	1/29	0.500	5.6

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS23BG2	200	80	65	95	70	6	48	8	60	23	189	55	106.6	6.6	25	16	M4	8
HC-KFS23BG2	200	100	80	115	85	6	65	10	74	33	207	75	124.6	6.6	35	20	M5	10
HC-KFS23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12
HC-KFS23BG2	200	115	95	135	100	8	75	10	85	35	212	85	129.6	9	40	25	M6	12

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11913*
(BC11922*)

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

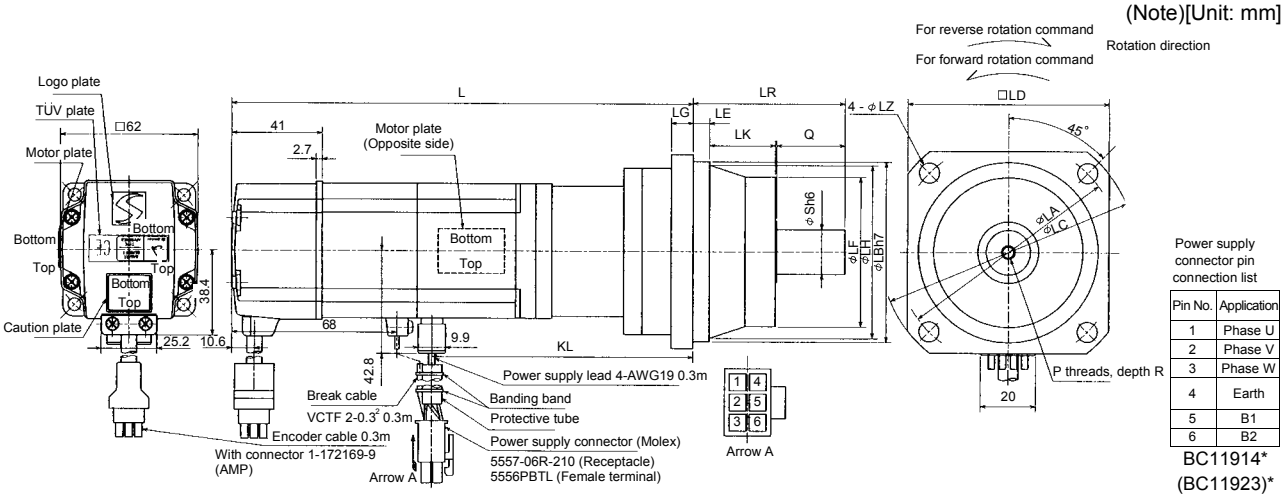
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS43BG2	400	1.3	BK2-05B-04MEKA	1/5	0.344	4.3
HC-MFS43BG2	400	1.3	BK3-09B-04MEKA	1/9	0.372	5.9
HC-MFS43BG2	400	1.3	BK4-20B-04MEKA	1/20	0.475	8.1
HC-MFS43BG2	400	1.3	BK4-29B-04MEKA	1/29	0.386	8.1

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS43BG2	400	100	80	115	85	6	65	10	74	33	216	75	131.6	6.6	35	20	M5	10
HC-MFS43BG2	400	115	95	135	100	8	75	10	85	35	237	85	152.6	9	40	25	M6	12
HC-MFS43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16
HC-MFS43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS43BG2	400	1.3	BK2-05B-04MEKA	1/5	0.660	4.3
HC-KFS43BG2	400	1.3	BK3-09B-04MEKA	1/9	0.690	5.9
HC-KFS43BG2	400	1.3	BK4-20B-04MEKA	1/20	0.790	8.1
HC-KFS43BG2	400	1.3	BK4-29B-04MEKA	1/29	0.710	8.1

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS43BG2	400	100	80	115	85	6	65	10	74	33	216	75	131.6	6.6	35	20	M5	10
HC-KFS43BG2	400	115	95	135	100	8	75	10	85	35	237	85	152.6	9	40	25	M6	12
HC-KFS43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16
HC-KFS43BG2	400	135	110	155	115	8	90	12	100	40	243	100	158.6	11	50	32	M8	16

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11914*
(BC11923)*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

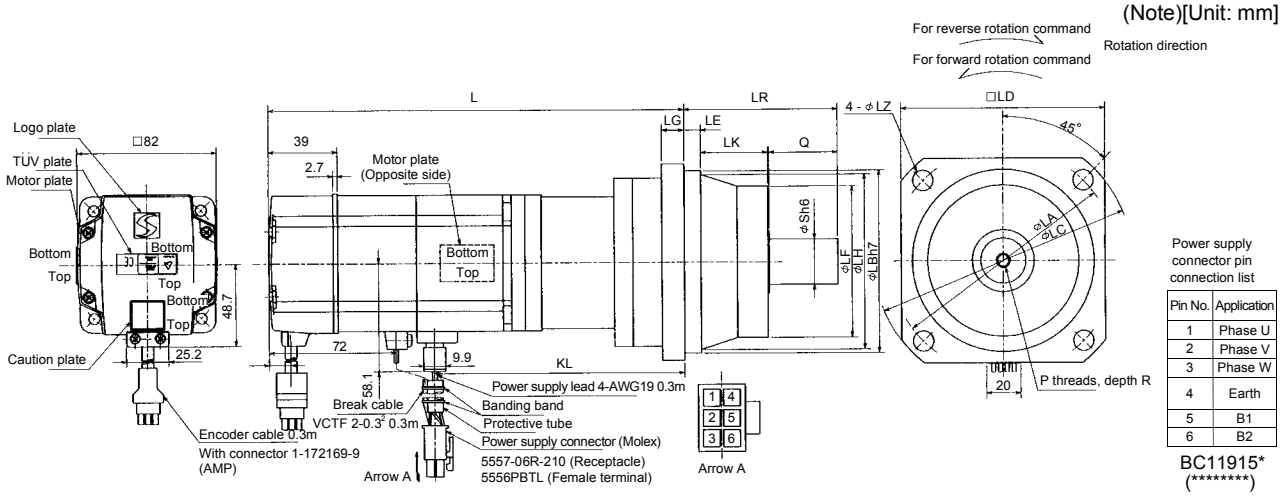
Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-MFS73BG2	750	2.4	BK3-05B-08MEKA	1/5	1.098	7.3
HC-MFS73BG2	750	2.4	BK4-09B-08MEKA	1/9	1.105	9.6
HC-MFS73BG2	750	2.4	BK5-20B-08MEKA	1/20	1.141	13.0
HC-MFS73BG2	750	2.4	BK5-29B-08MEKA	1/29	1.035	13.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS73BG2	750	115	95	135	100	8	75	10	85	35	247.5	85	156.7	9	40	25	M6	12
HC-MFS73BG2	750	135	110	155	115	8	90	12	100	40	275.5	100	184.7	11	50	32	M8	16
HC-MFS73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20
HC-MFS73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20

Model	Output [W]	Brake static friction torque [N・m]	Reduction Gear Model	Reduction Ratio	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-KFS73BG2	750	2.4	BK3-05B-08MEKA	1/5	2.008	7.3
HC-KFS73BG2	750	2.4	BK4-09B-08MEKA	1/9	2.015	9.6
HC-KFS73BG2	750	2.4	BK5-20B-08MEKA	1/20	2.051	13.0
HC-KFS73BG2	750	2.4	BK5-29B-08MEKA	1/29	1.945	13.0

Model	Output [W]	Variable Dimensions																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS73BG2	750	115	95	135	100	8	75	10	85	35	247.5	85	156.7	9	40	25	M6	12
HC-KFS73BG2	750	135	110	155	115	8	90	12	100	40	275.5	100	184.7	11	50	32	M8	16
HC-KFS73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20
HC-KFS73BG2	750	150	125	175	130	10	105	15	115	43	283.5	115	192.7	14	60	40	M10	20

(Note)[Unit: mm]



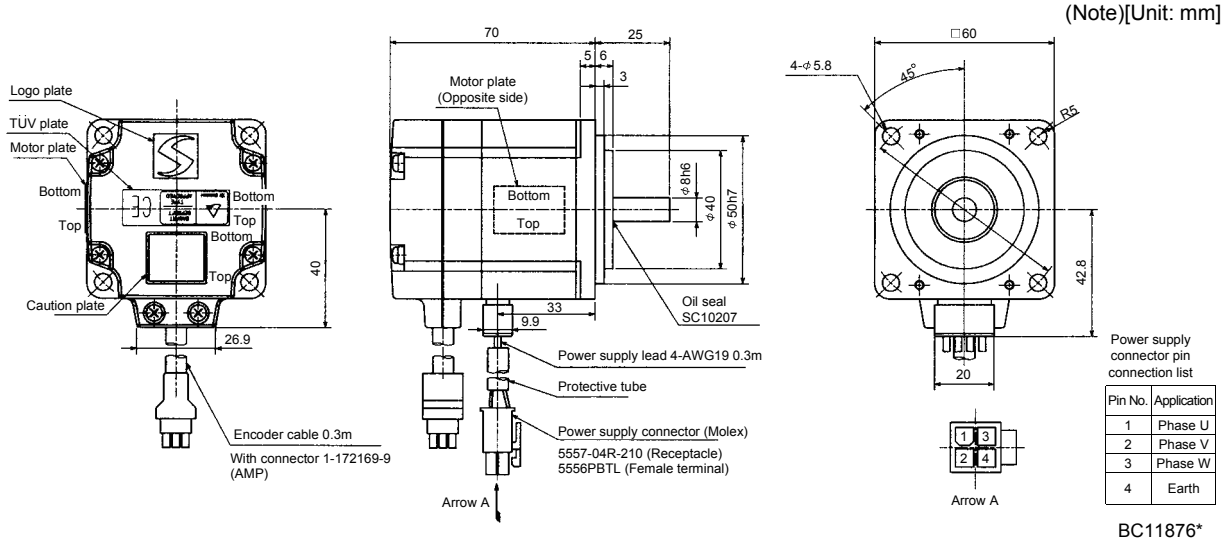
Note: The dimensions without tolerances are reference dimensions.

7.1.12 HC-UFS 3000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UFS13	100	0.066	0.8

(Note)[Unit: mm]



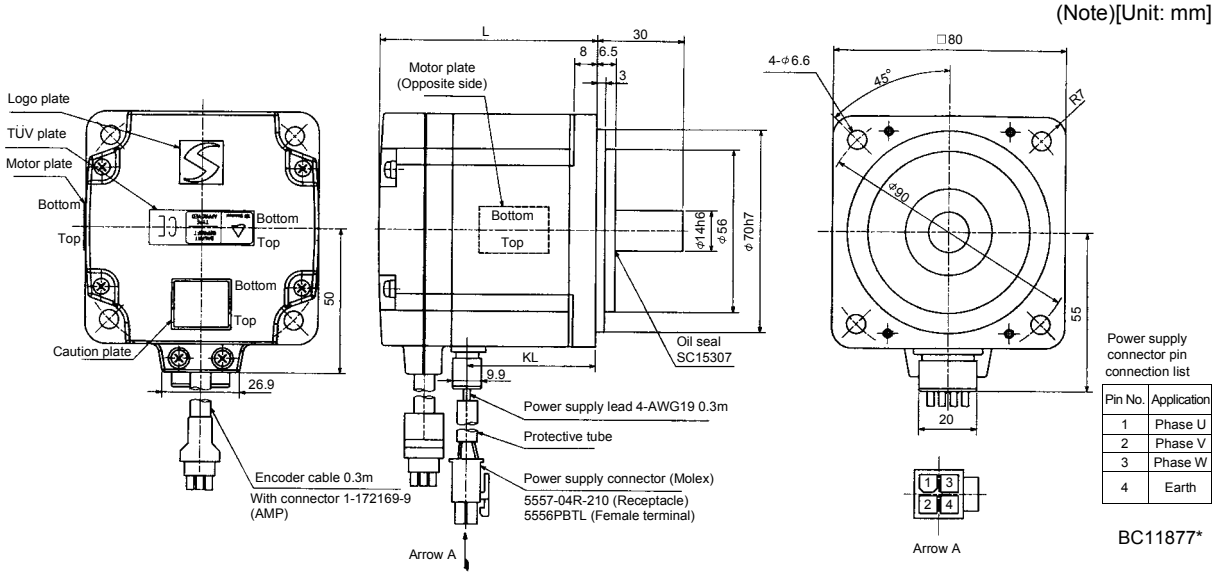
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11876*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Variable Dimensions		Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL		
HC-UFS23	200	77	43.8	0.241	1.5
HC-UFS43	400	92	58.8	0.365	1.7

(Note)[Unit: mm]



Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

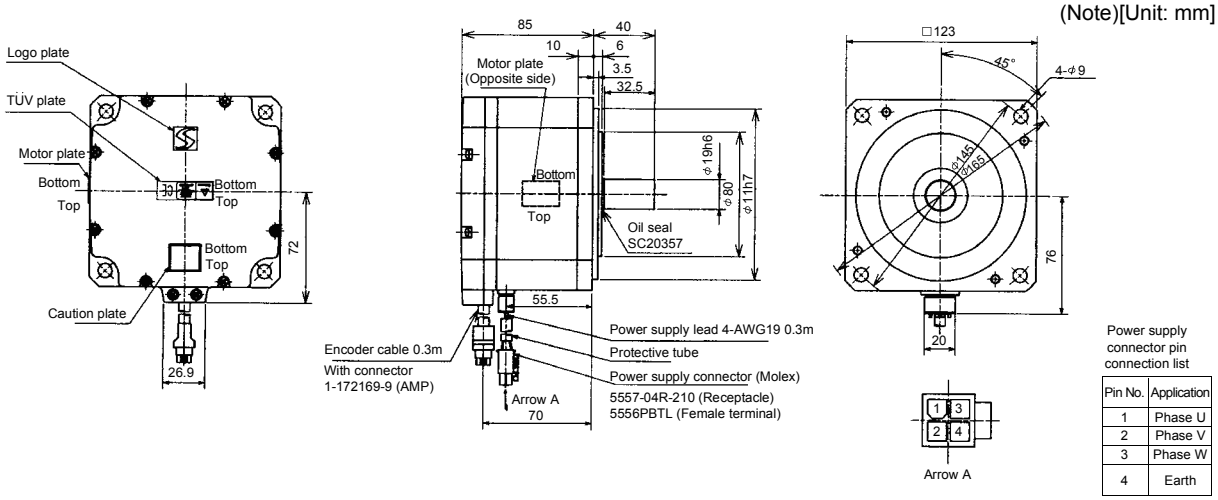
BC11877*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UFS73	750	5.9	5.0

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

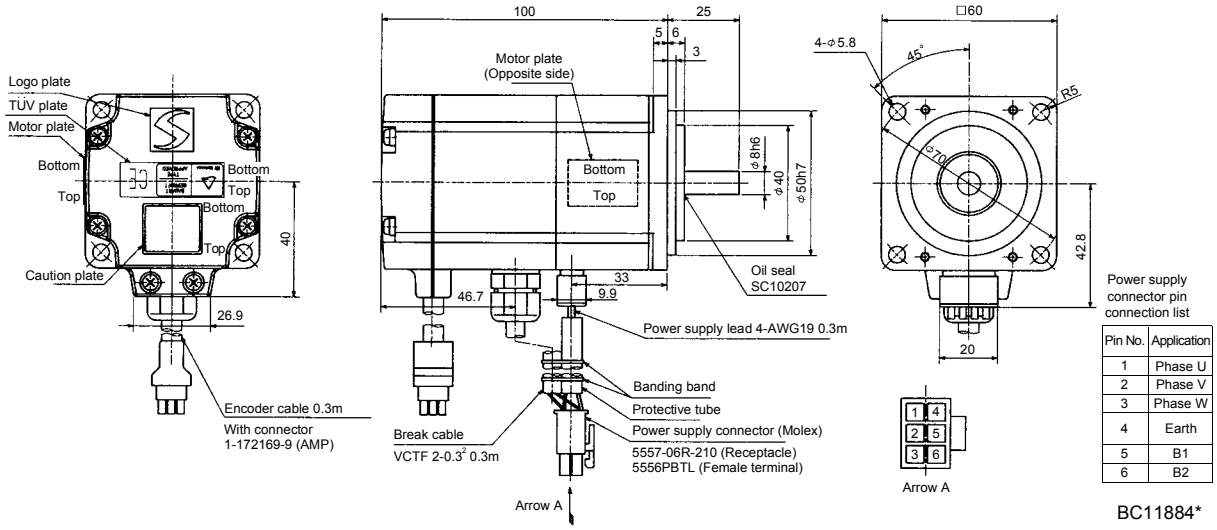
BC11878*

Note: The dimensions without tolerances are reference dimensions.

(2) With electromagnetic brake

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UFS13B	100	0.32	0.074	1.2

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

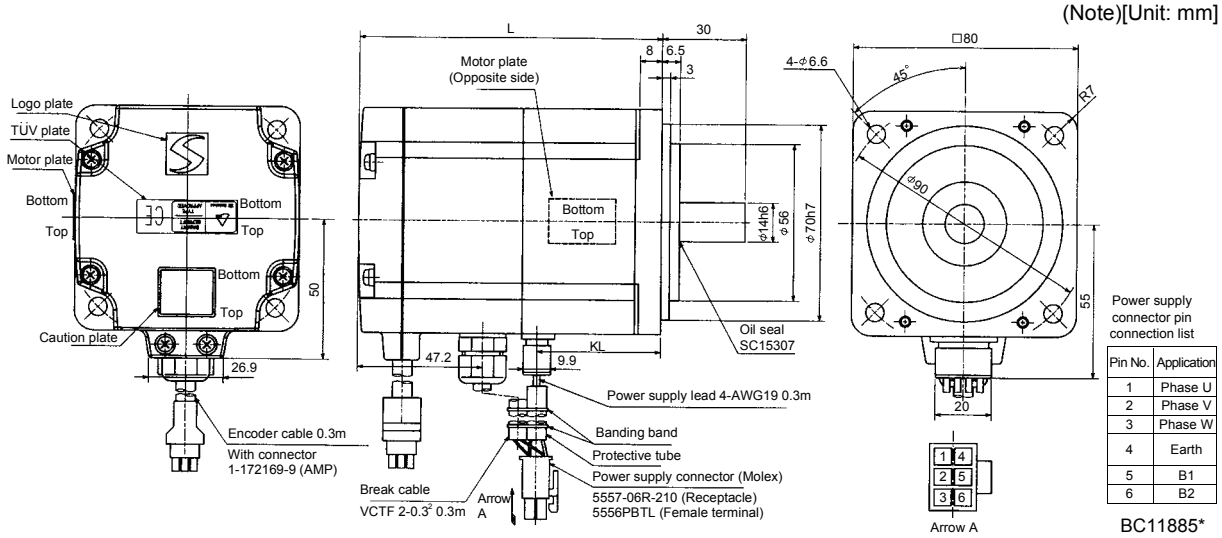
BC11884*

Note: The dimensions without tolerances are reference dimensions.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions		Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
		L	KL			
HC-UFS23B	200	111	43.8	1.3	0.323	2.2
HC-UFS43B	400	126	58.8	1.3	0.447	2.4

(Note)[Unit: mm]



Power supply connector pin connection list

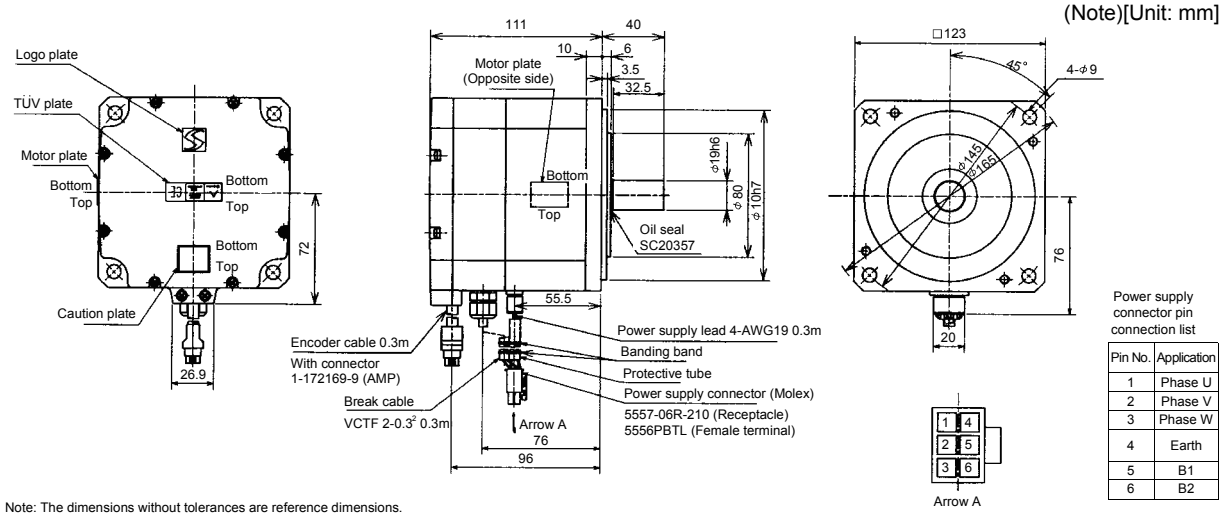
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11885*

Note: The dimensions without tolerances are reference dimensions.

Model	Output [W]	Brake static friction torque [N・m]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-UFS73B	750	2.4	6.1	6.2

(Note)[Unit: mm]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11886*

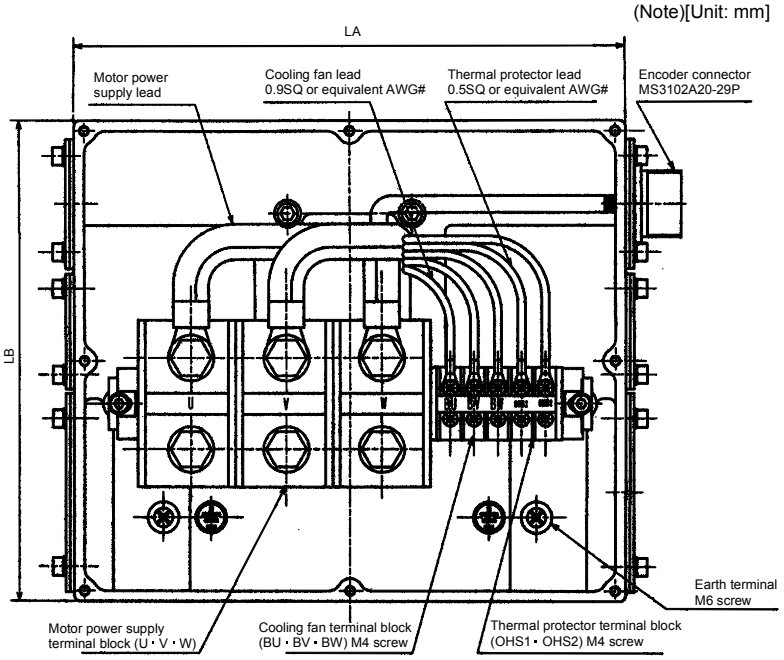
Note: The dimensions without tolerances are reference dimensions.

7.1.13 HA-LFS series

Terminal box detail diagram

Motor Model		HA-LFS15K1 HA-LFS20K1 HA-LFS22K1M HA-LFS15K14 HA-LFS20K14 HA-LFS22K1M4 HA-LFS30K1M4 HA-LFS30K24 HA-LFS37K24	HA-LFS25K1 to 37K1 HA-LFS30K1M ▪ 37K1M HA-LFS30K2 ▪ 37K2 HA-LFS25K14 to 37K14 HA-LFS37K1M4 to 50K1M4 HA-LFS45K24 ▪ 55K24
Motor power supply lead size		8mm² (AWG8) × 2 parallel	22mm²(AWG4) × 2 parallel
Motor power supply terminal block screw size		M8	M10
Terminal box dimensions (mm)	LA	220	266
	LB	210	230

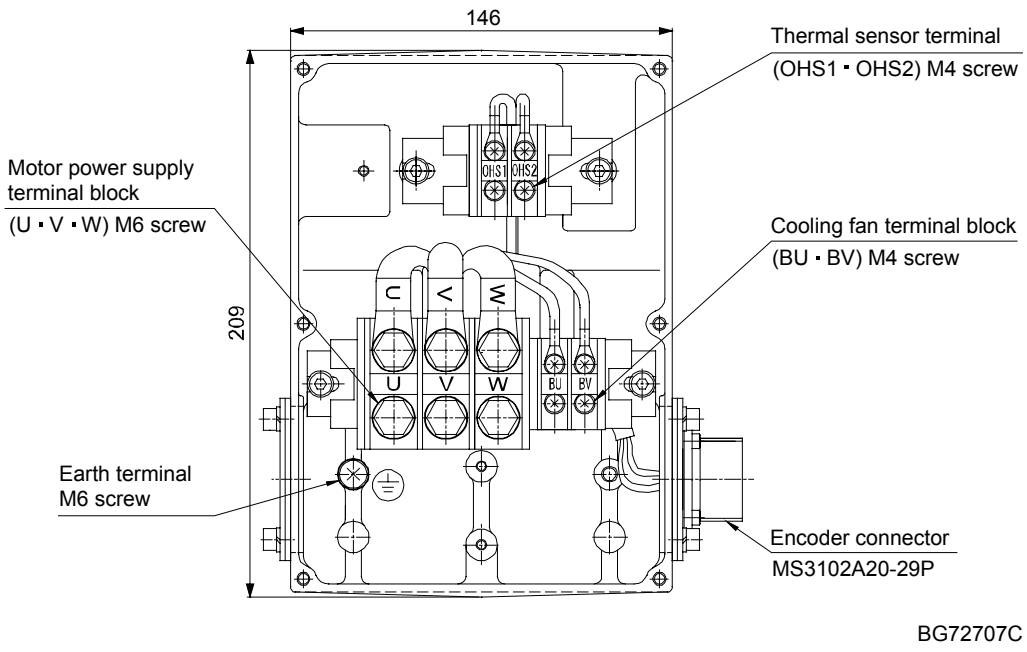
(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

HA-LFS 601 ▪ 701M ▪ 11K2 ▪ 6014 ▪ 701M4 ▪ 11K24 terminal box detail diagram

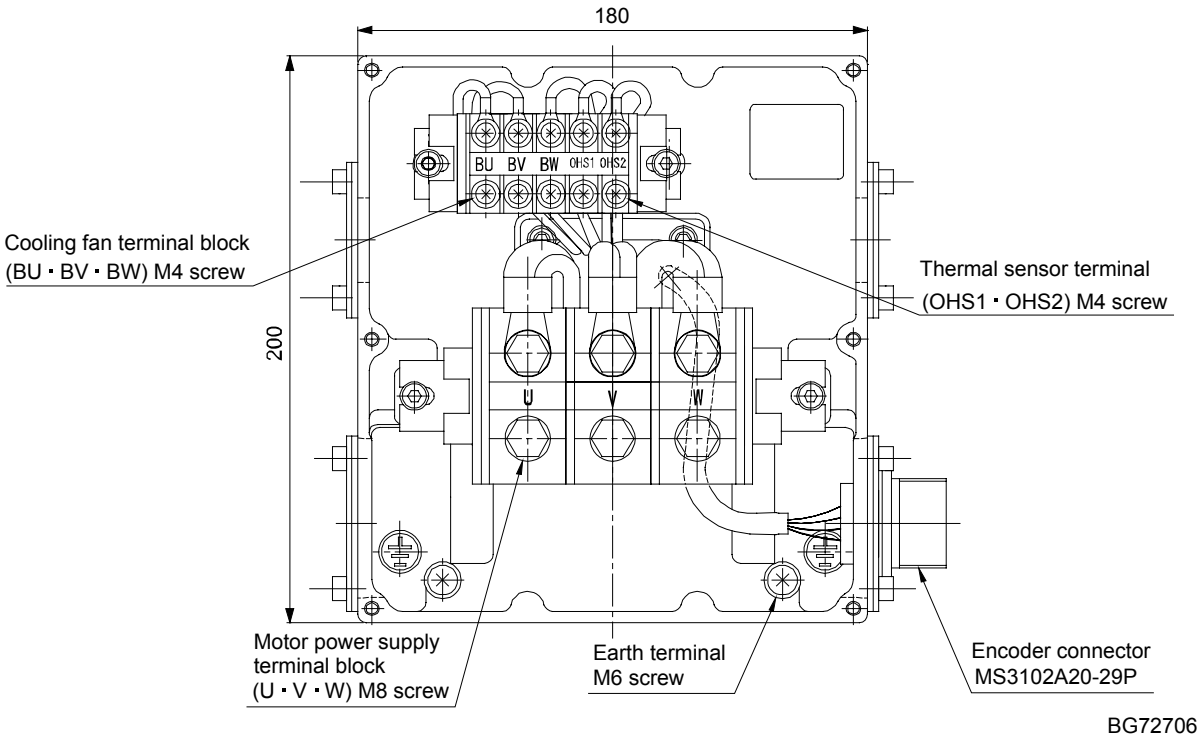
(Note)[Unit: mm]



Note. The dimensions without tolerances are reference dimensions.

HA-LFS 801・12K1・11K1M・15K1M・15K2・22K2・8014・12K14・11K1M4・15K1M4・15K24・22K24
terminal box detail diagram

(Note)[Unit: mm]

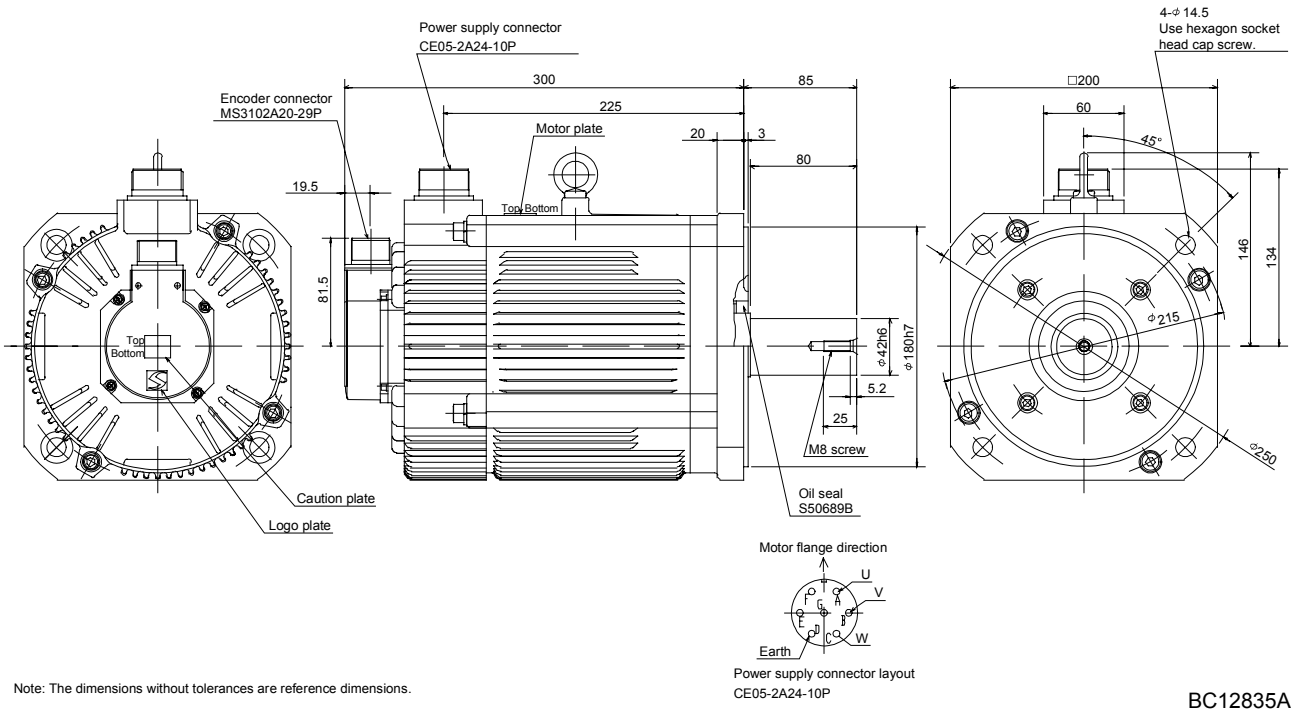


Note. The dimensions without tolerances are reference dimensions.

(1) Standard (Without electromagnetic brake, without reduction gear)

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS502	5	74.0	28

(Note)[Unit: mm]

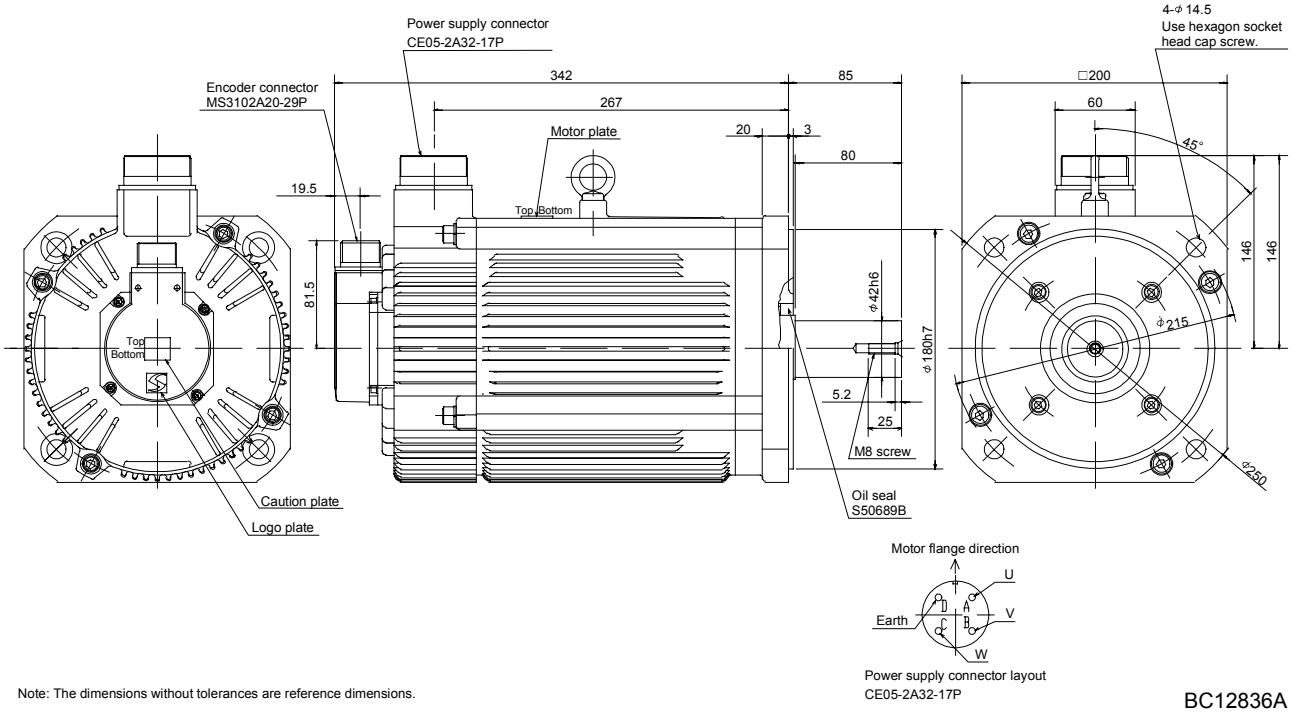


Note: The dimensions without tolerances are reference dimensions.

BC12835A

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS702	7	94.2	35

(Note)[Unit: mm]



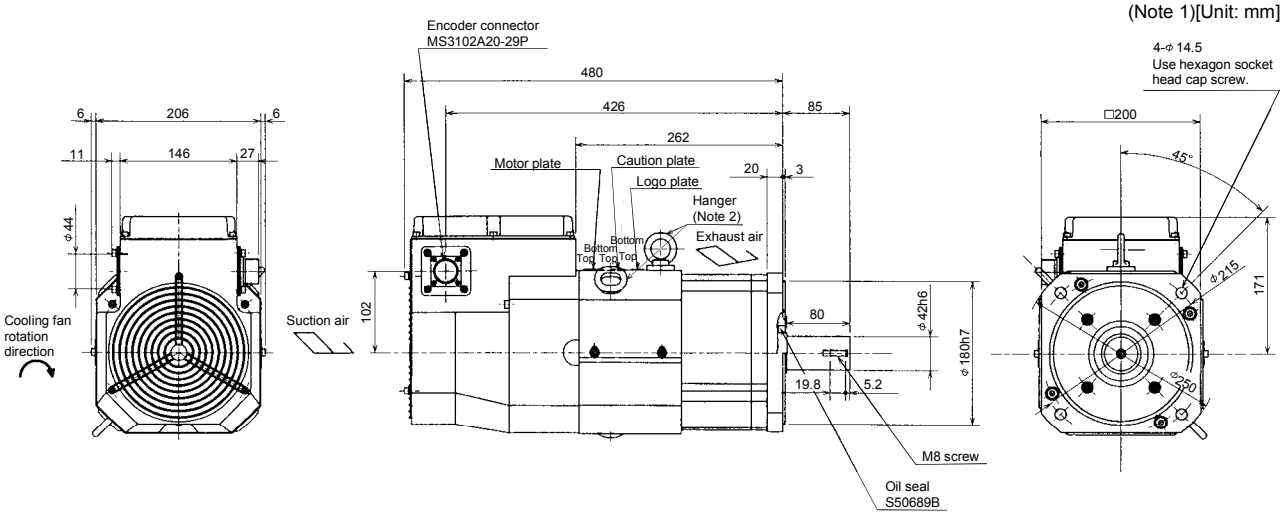
Note: The dimensions without tolerances are reference dimensions.

BC12836A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS601 HA-LFS6014	6	105	55
HA-LFS701M HA-LFS701M4	7		
HA-LFS11K2 HA-LFS11K24	11		

(Note 1)[Unit: mm]

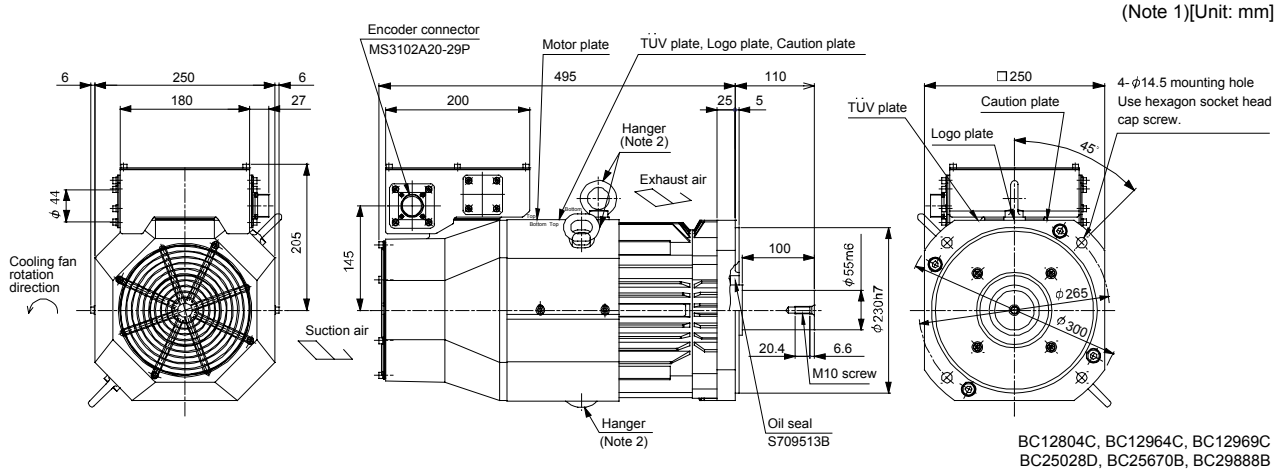


BC12837A, BC12582*, BC12967A

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12×20 mm or less.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS801 HA-LFS8014	8	220	95
HA-LFS11K1M HA-LFS11K1M4	11		
HA-LFS15K2 HA-LFS15K24	15		

(Note 1)[Unit: mm]



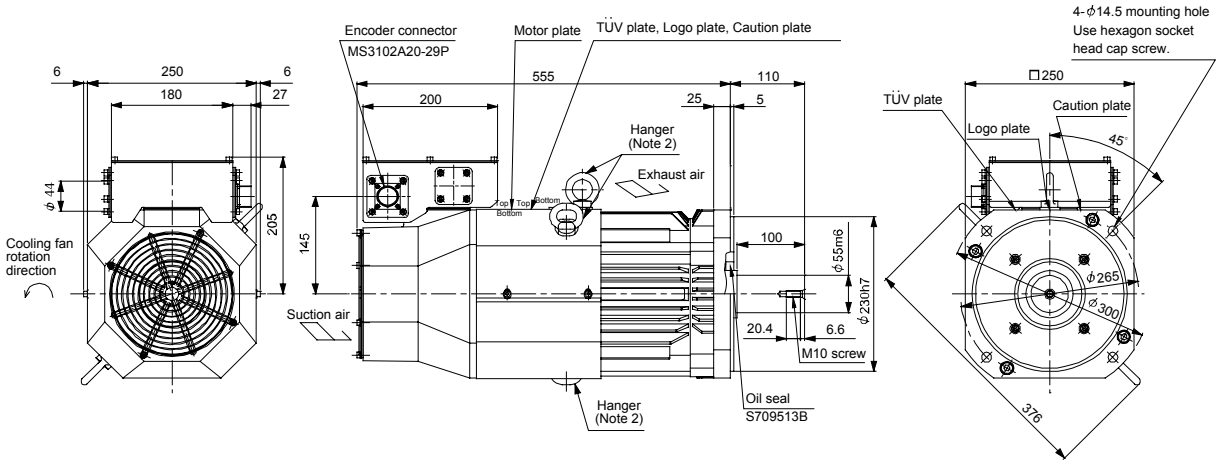
BC12804C, BC12964C, BC12969C
BC25028D, BC25670B, BC29888B

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12×20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS12K1 HA-LFS12K14	12	295	115
HA-LFS15K1M HA-LFS15K1M4	15		
HA-LFS22K2 HA-LFS22K24	22		

(Note 1)[Unit: mm]

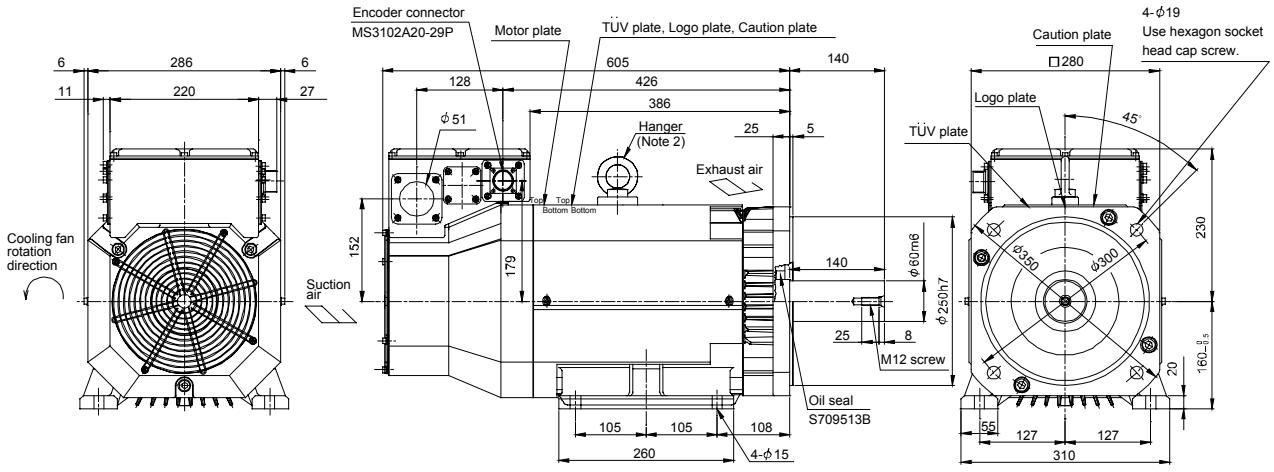


BC12970C, BC13039C, BC13158B
BC25300D, BC25349B, BC33032*

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12 × 20 mm or less.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS15K1 HA-LFS15K14	15	550	160
HA-LFS22K1M HA-LFS22K1M4	22		
HA-LFS30K24	30		

(Note 1)[Unit: mm]



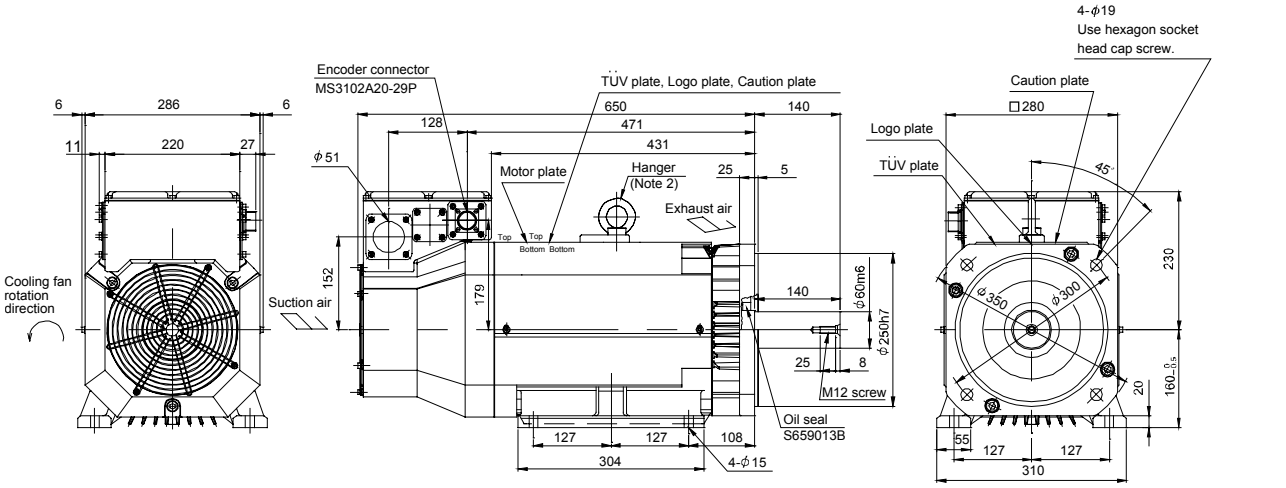
BC12966A, BC13040A
(BC13233B, BC13235*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS20K1 HA-LFS20K14	20	650	180
HA-LFS30K1M4	30		
HA-LFS37K24	37		

(Note 1)[Unit: mm]

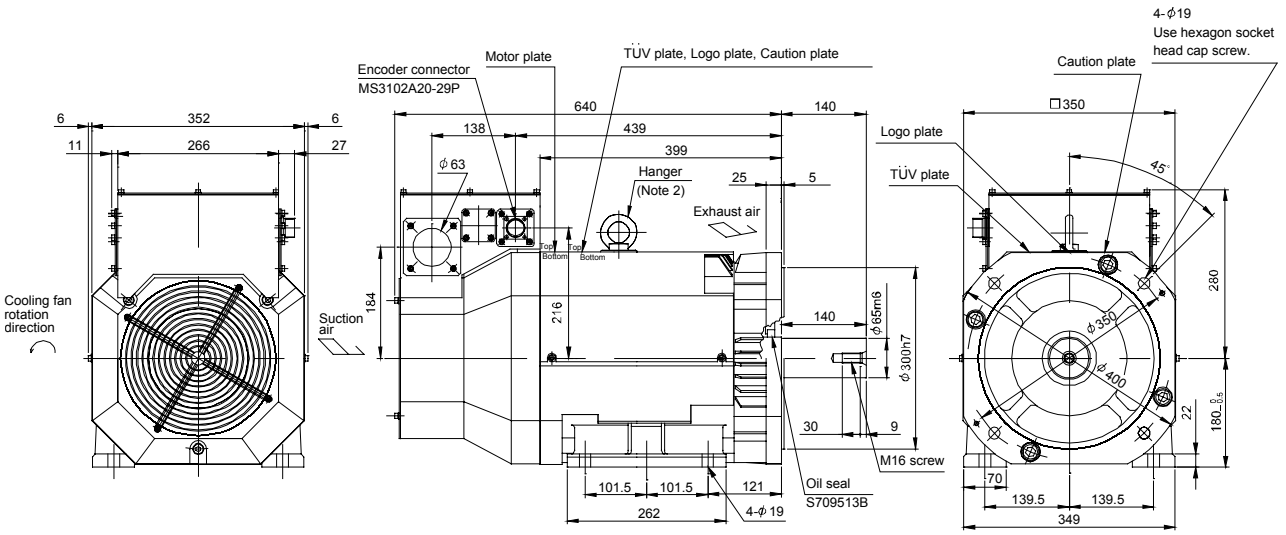


BC12972A
(BC13389B, BC13994*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20 mm or less.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS25K1 HA-LFS25K14	25	1080	230
HA-LFS37K1M HA-LFS37K1M4	37		
HA-LFS45K24	45		

(Note 1)[Unit: mm]



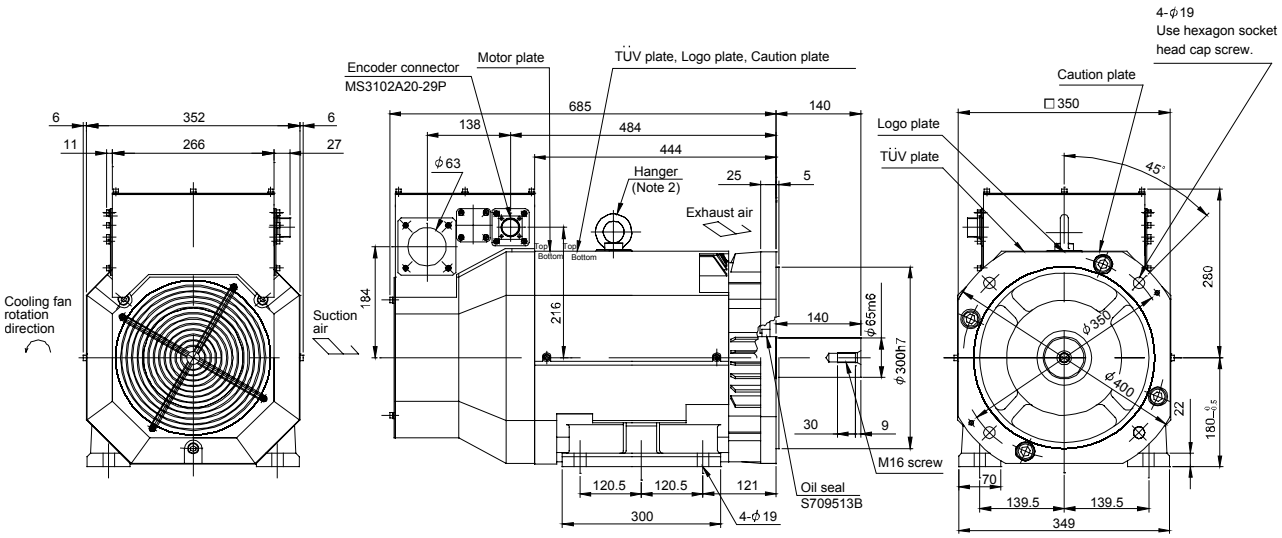
BC12508*, BC12973A
(BC13391B, BC13390*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS30K1 HA-LFS30K14	30	1310	250
HA-LFS45K1M4	45		
HA-LFS55K24	55		

(Note 1)[Unit: mm]

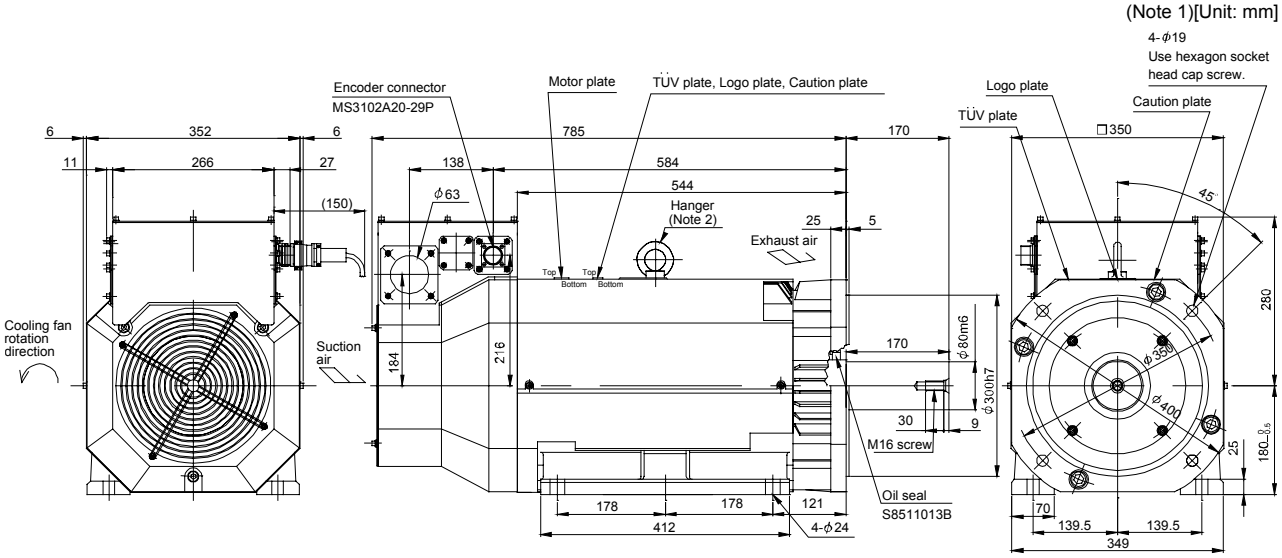


BC11371B
(BC13393B, BC13392*, BC13232*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS37K1 HA-LFS37K14	37	1870	335
HA-LFS50K1M4	50		

(Note 1)[Unit: mm]



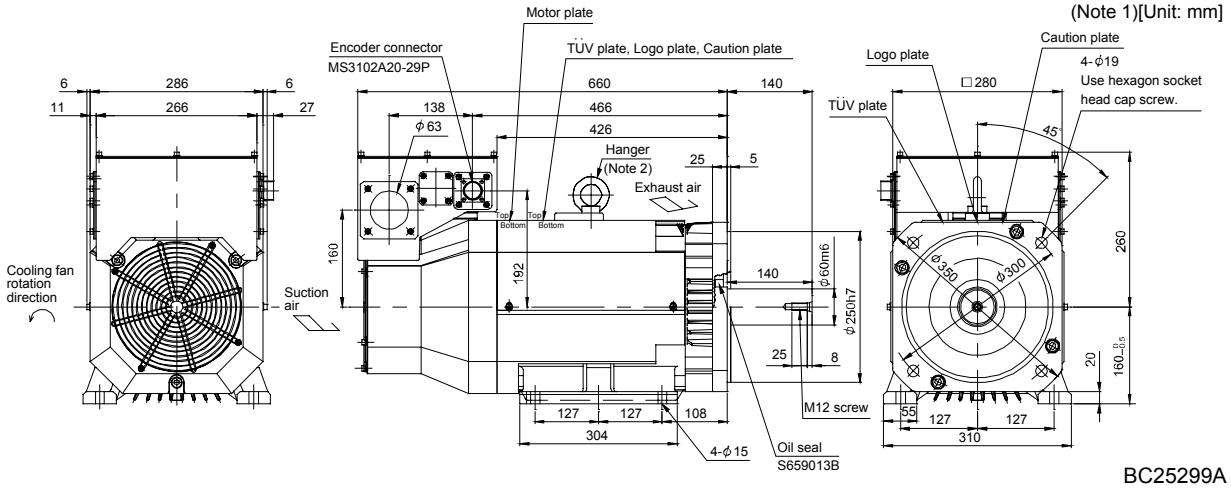
BC12221*
(BC13395B)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS30K1M	30	650	180
HA-LFS37K2	37		

(Note 1)[Unit: mm]

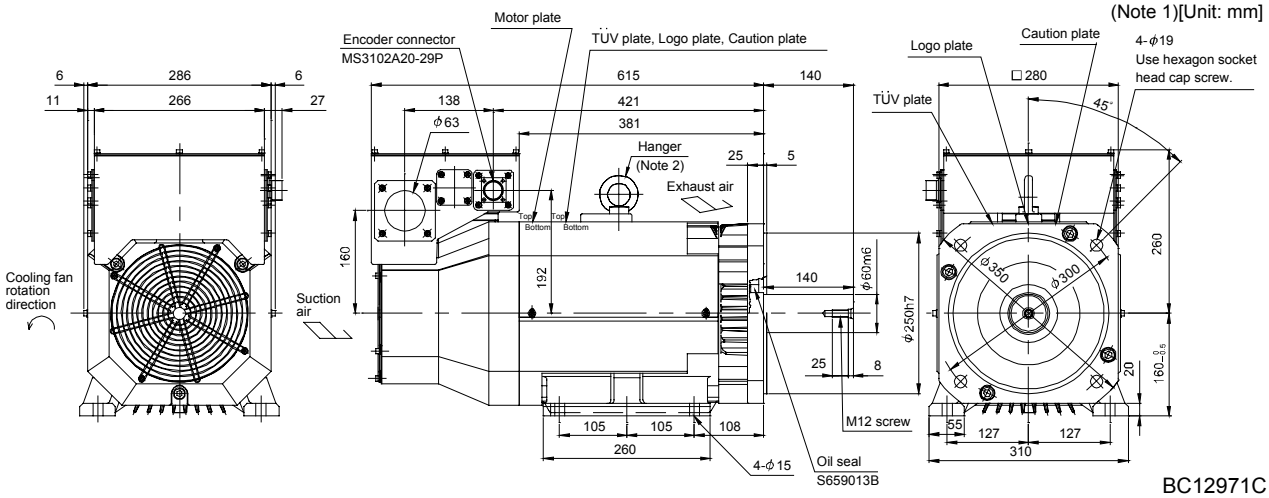


BC25299A

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20 mm or less.

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HA-LFS30K2	30	550	160

(Note 1)[Unit: mm]



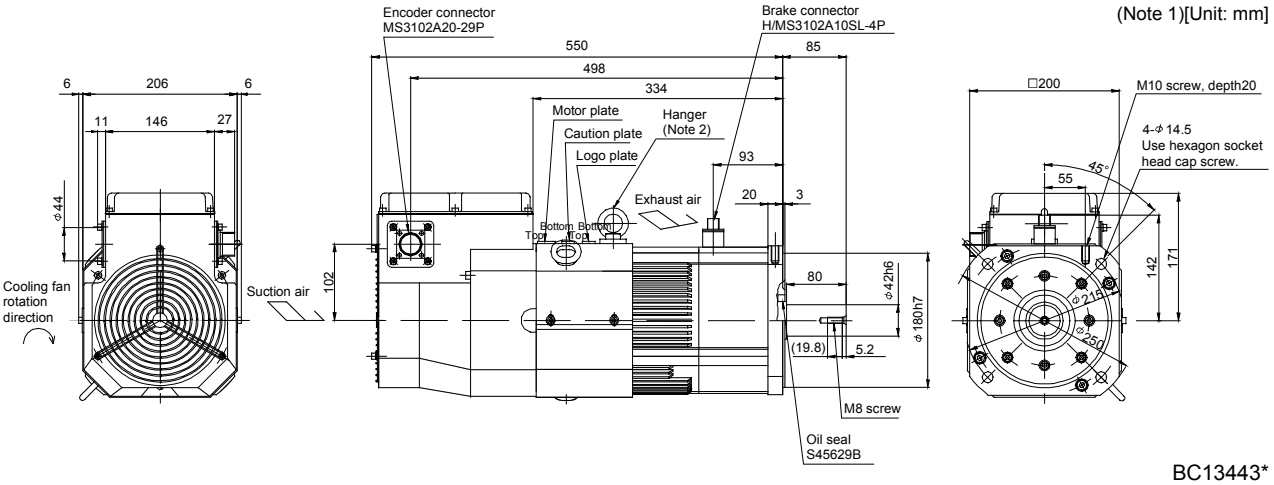
BC12971C

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20 mm or less.

(2) With electromagnetic brake

Model	Output [kW]	Brake static friction torque [N・m]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HA-LFS601B HA-LFS6014B	6	82	113	70
HA-LFS701MB HA-LFS701M4B	7			
HA-LFS11K2B HA-LFS11K24B	11			

(Note 1)[Unit: mm]

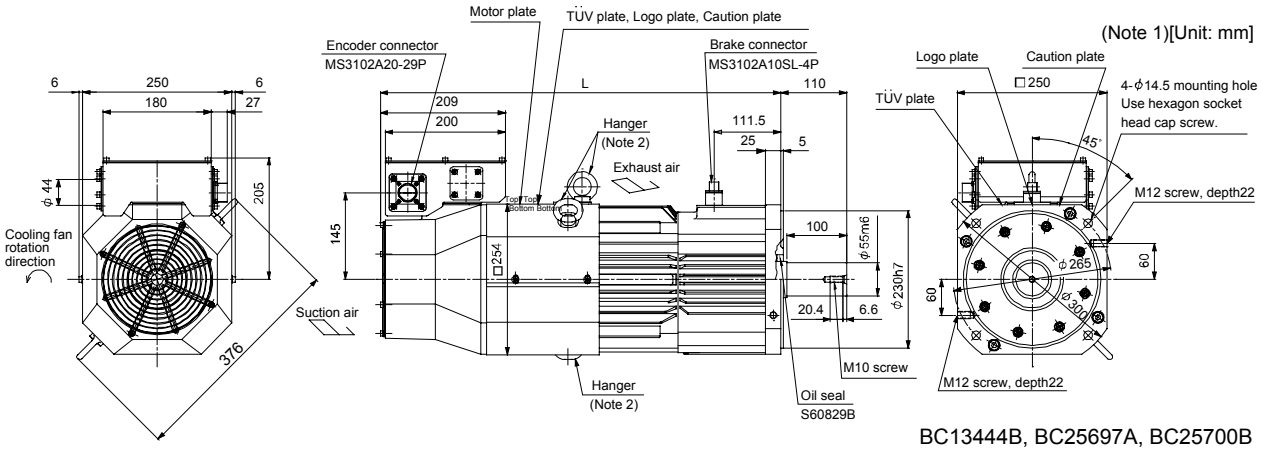


BC13443*
(BC25146*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M10 × 20 mm or less.

Model	Output [kW]	Variable dimensions L	Brake static friction torque [N・m]	Inertia Moment J[×10⁻⁴kg・m²]	Mass [kg]
HA-LFS801B HA-LFS8014B	8	610	160.5	293	126.0
HA-LFS11K1MB HA-LFS11K1M4B	11				
HA-LFS15K2B HA-LFS15K24B	15				
HA-LFS12K1B HA-LFS12K14B	12	670	160.5	369	146.0
HA-LFS15K1MB HA-LFS15K1M4B	15				
HA-LFS22K2B HA-LFS22K24B	22				

(Note 1)[Unit: mm]



BC13444B, BC25697A, BC25700B
BC25746A, BC25767A, BC25865B
BC25985B, BC33030*, BC33034*

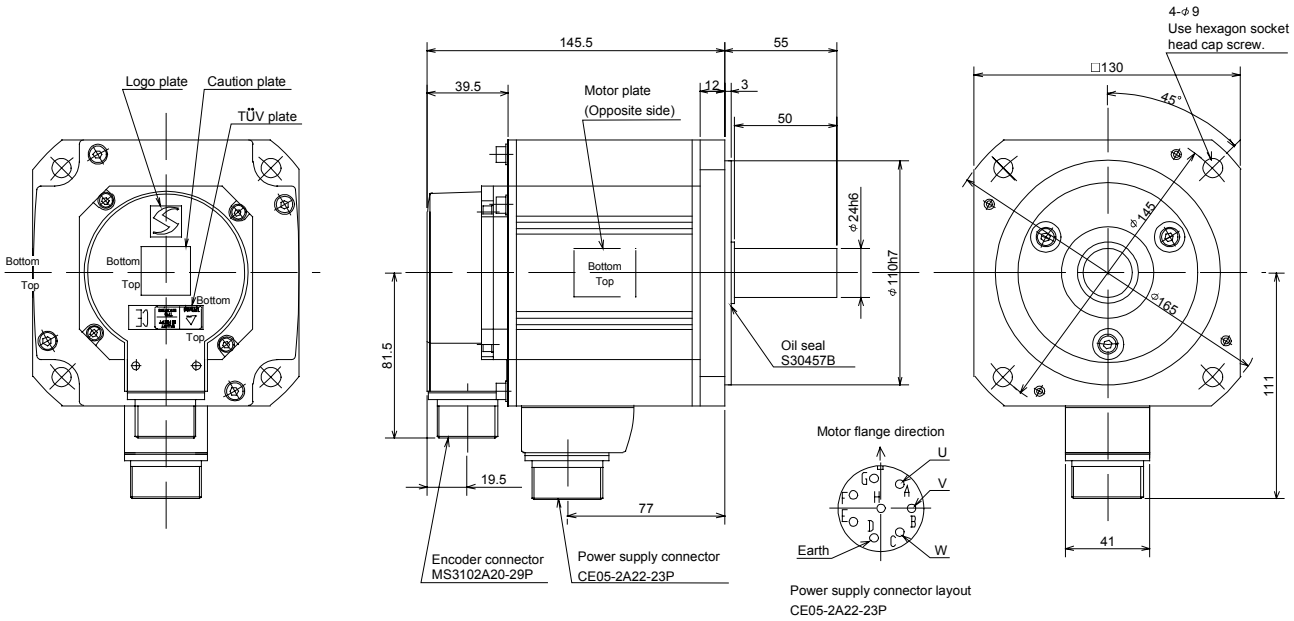
Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12 × 20 mm or less.

7.1.14 HC-LFS series

(1) Standard (without electromagnetic brake)

Model	Output [kW]	Inertia Moment J[$\times 10^{-4}$ kg・m^2]	Mass [kg]
HC-LFS52	0.5	3.2	6.5

(Note)[Unit: mm]

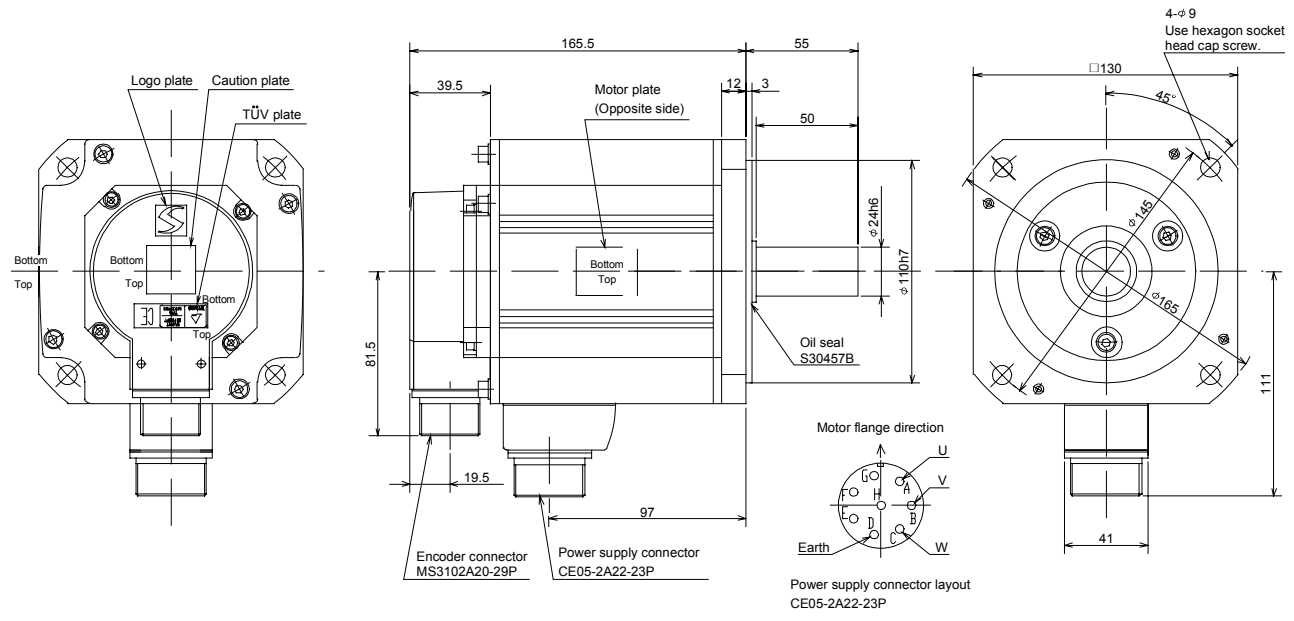


Note: The dimensions without tolerances are reference dimensions.

BC12908*

Model	Output [kW]	Inertia Moment J[$\times 10^{-4}$ kg・m^2]	Mass [kg]
HC-LFS102	1.0	4.6	8

(Note)[Unit: mm]



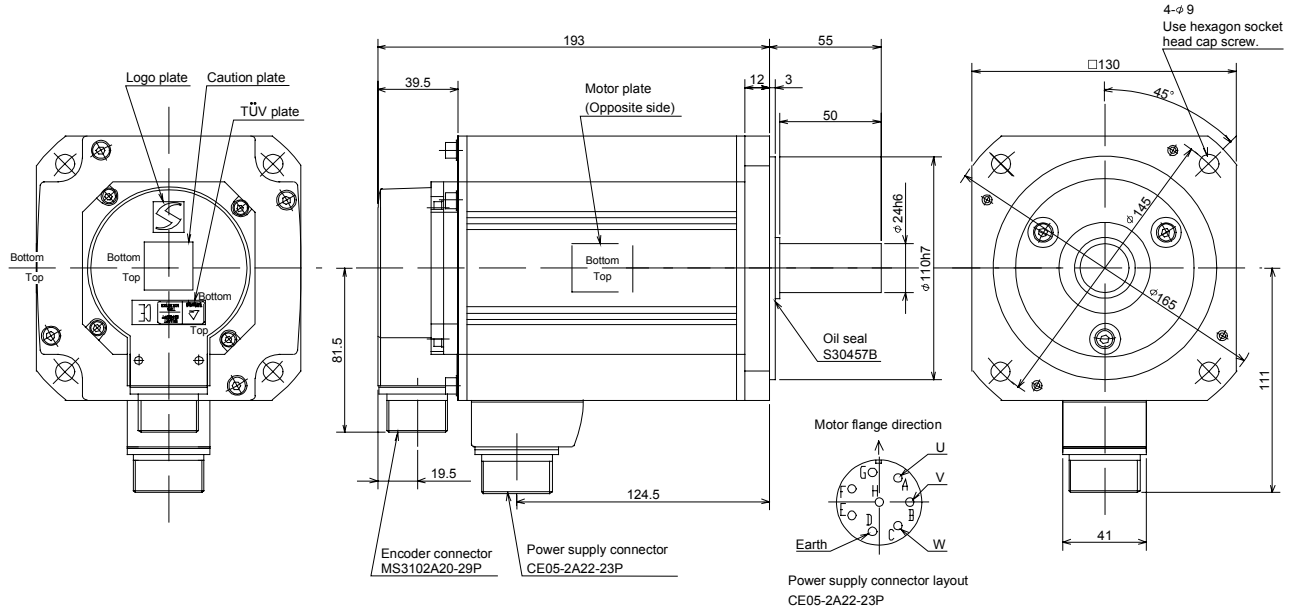
Note: The dimensions without tolerances are reference dimensions.

BC12909*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-LFS152	1.5	6.4	10

(Note)[Unit: mm]

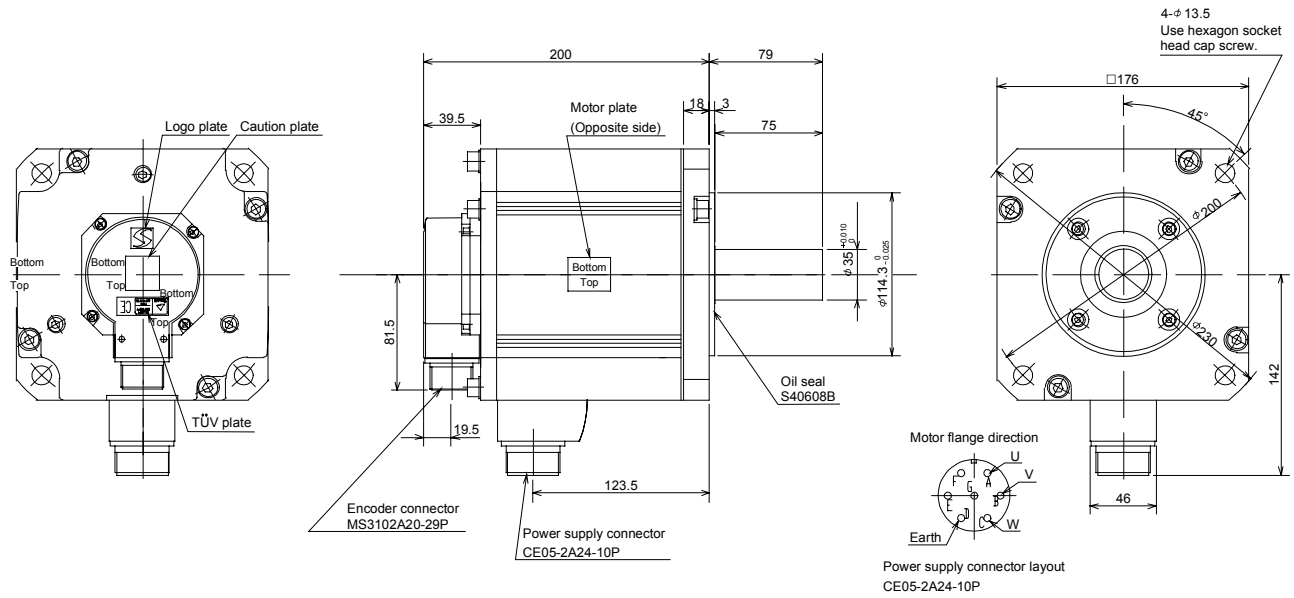


Note: The dimensions without tolerances are reference dimensions.

BC12910A

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-LFS202	2.0	22	21

(Note)[Unit: mm]

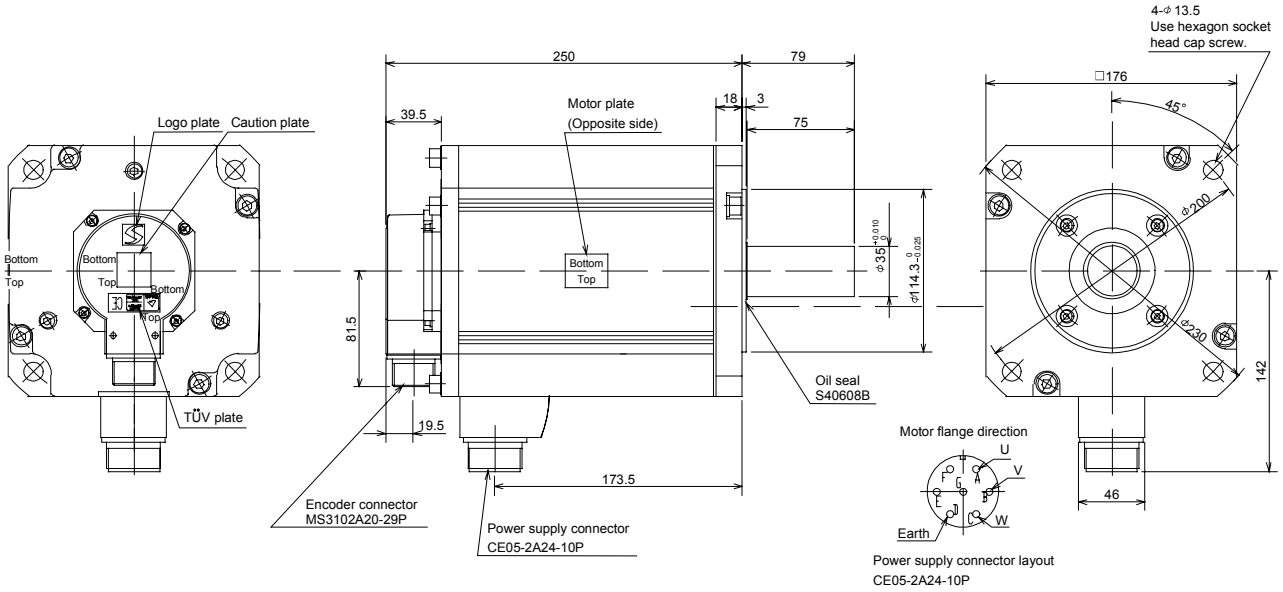


Note: The dimensions without tolerances are reference dimensions.

BC13035*

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]
HC-LFS302	3.0	36	28

(Note)[Unit: mm]



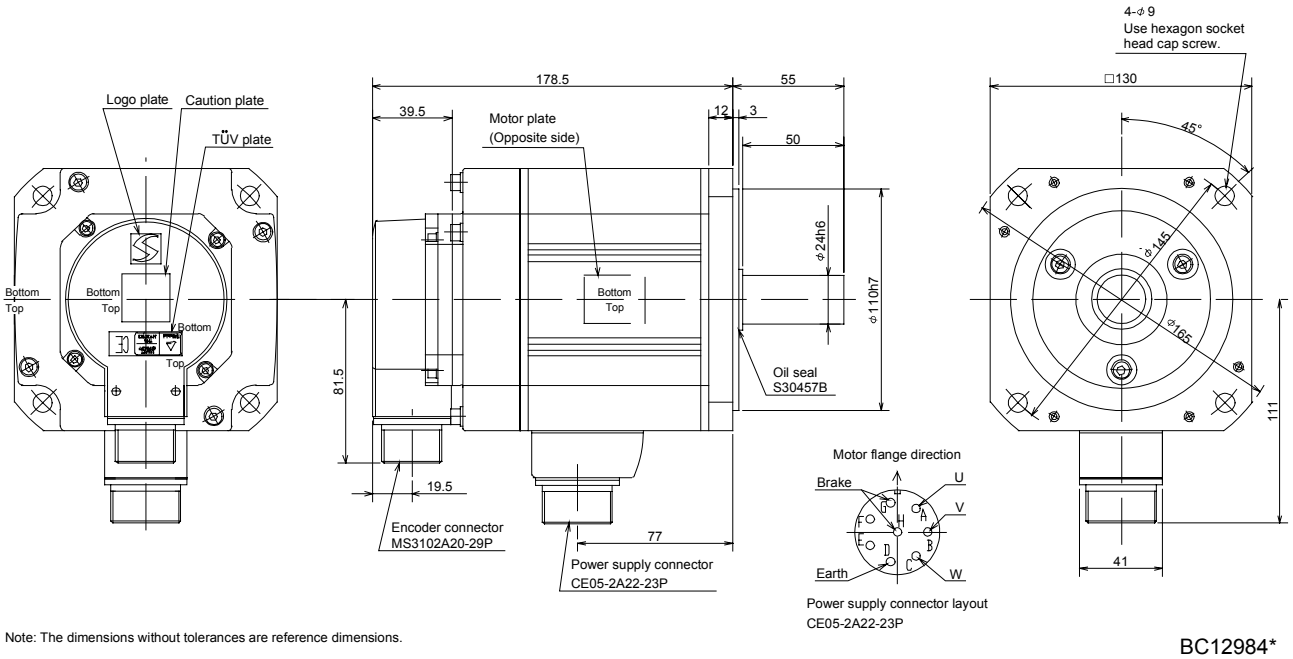
Note: The dimensions without tolerances are reference dimensions.

BC13036*

(2) With electromagnetic brake

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-LFS52B	0.5	5.2	9	8.3

(Note)[Unit: mm]



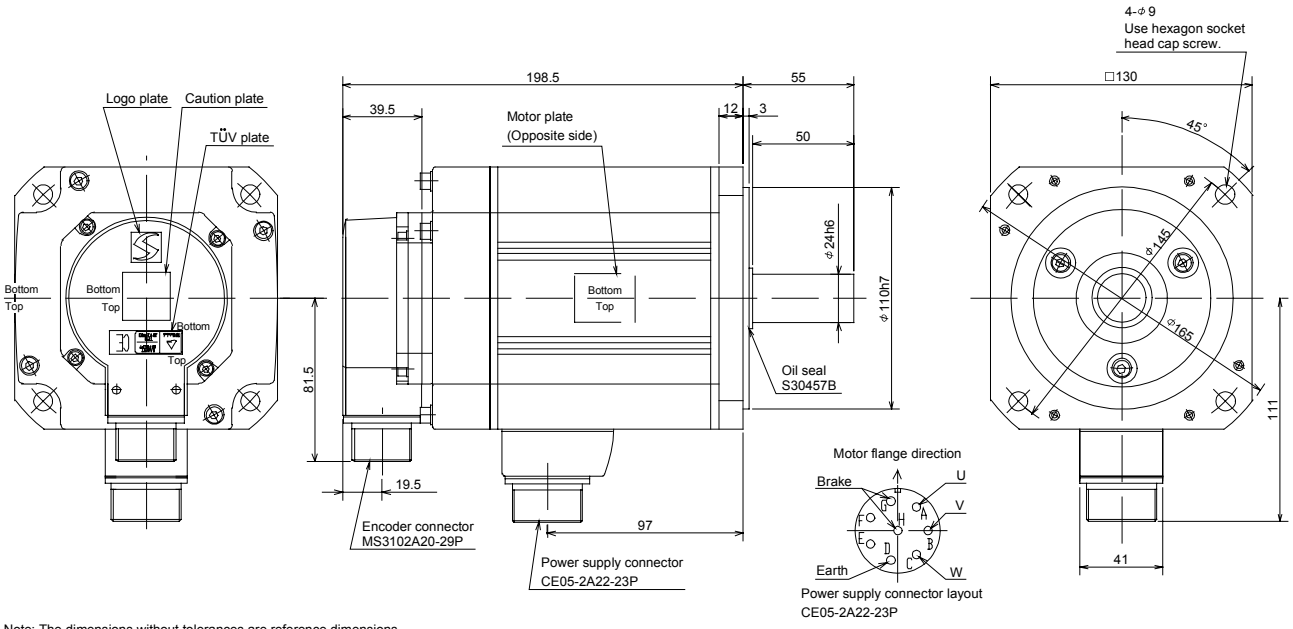
Note: The dimensions without tolerances are reference dimensions.

BC12984*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-LFS102B	1.0	6.6	10.5	8.3

(Note)[Unit: mm]

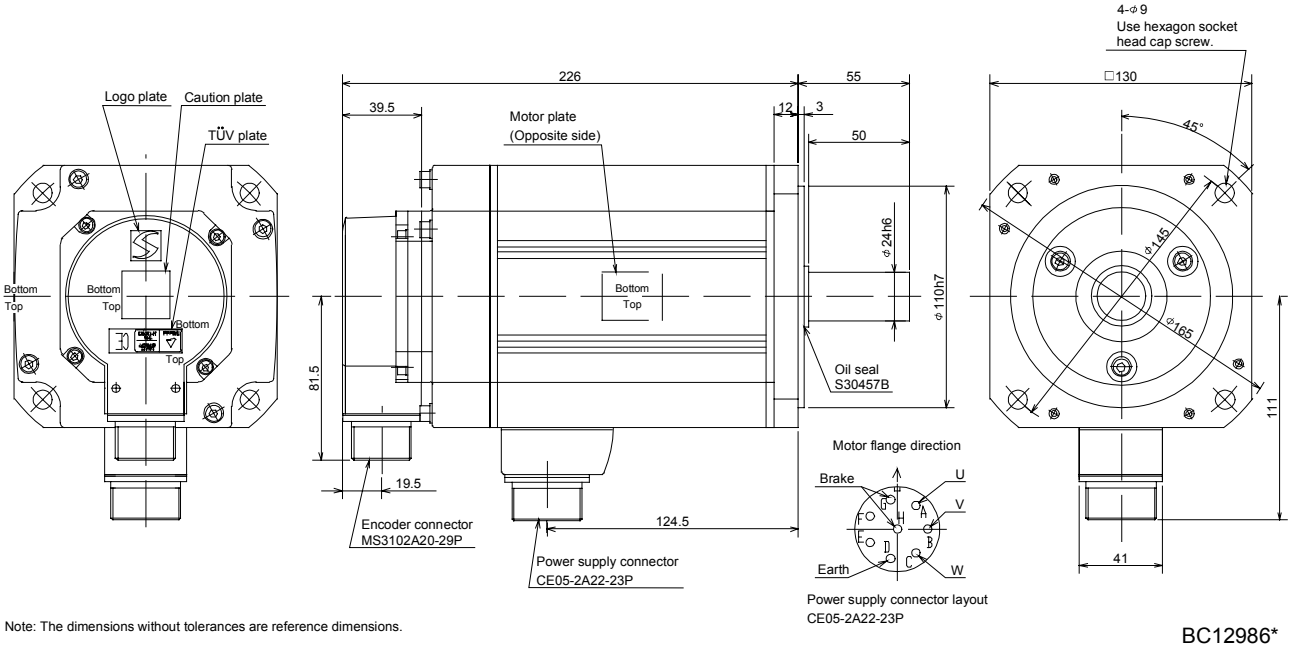


Note: The dimensions without tolerances are reference dimensions.

BC12985*

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-LFS152B	1.5	8.4	12.5	8.3

(Note)[Unit: mm]



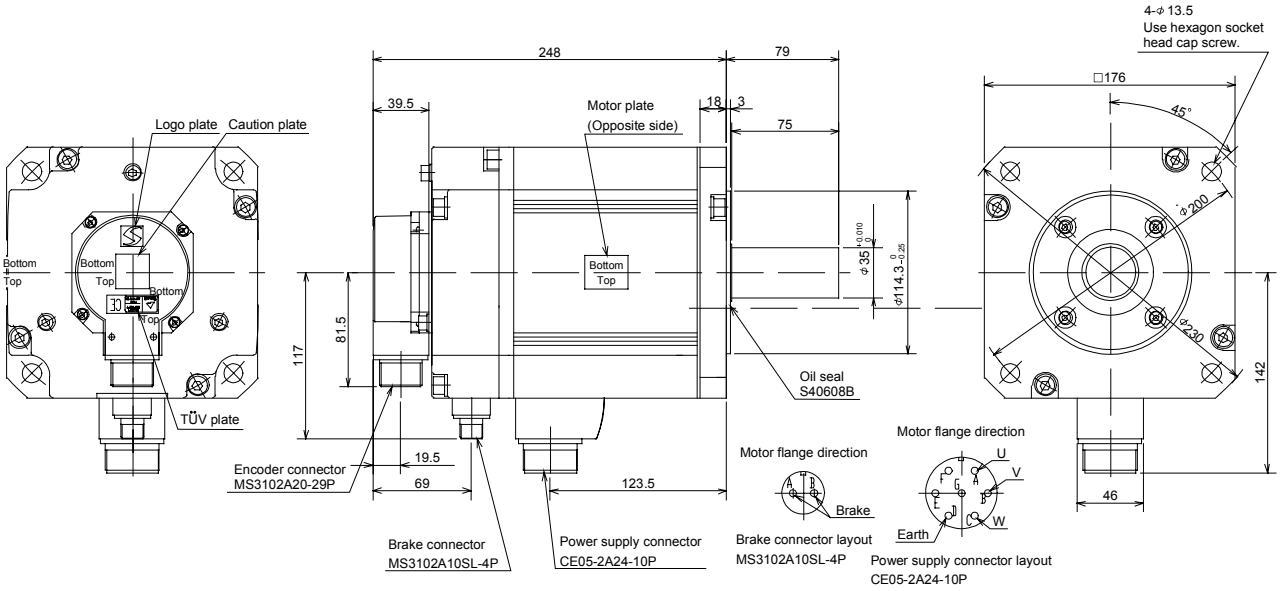
Note: The dimensions without tolerances are reference dimensions.

BC12986*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-LFS202B	2.0	32	27	43.1

(Note)[Unit: mm]

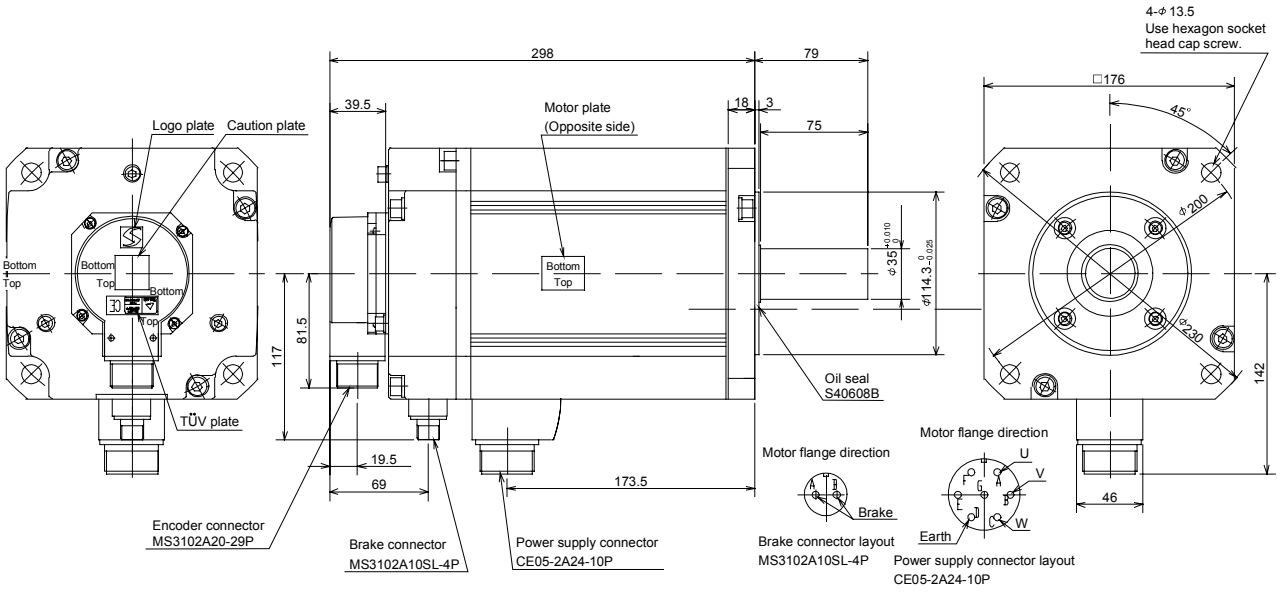


Note: The dimensions without tolerances are reference dimensions.

BC13037A

Model	Output [kW]	Inertia Moment J[×10^{-4}kg・m^2]	Mass [kg]	Brake static friction torque [N・m]
HC-LFS302B	3.0	46	34	43.1

(Note)[Unit: mm]



Note: The dimensions without tolerances are reference dimensions.

BC13038A

7.2 Servo motors (in inches)

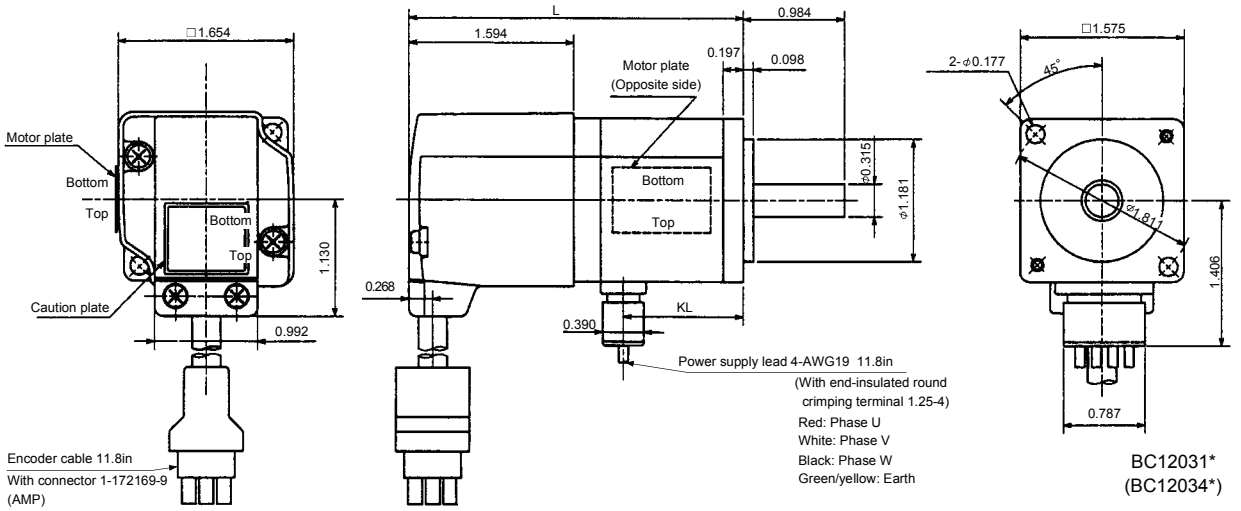
> POINT
> The values in yards/pounds are reference values.

7.2.1 HC-MF · HC-KF series

(1) Standard (without electromagnetic brake, without reduction gear)

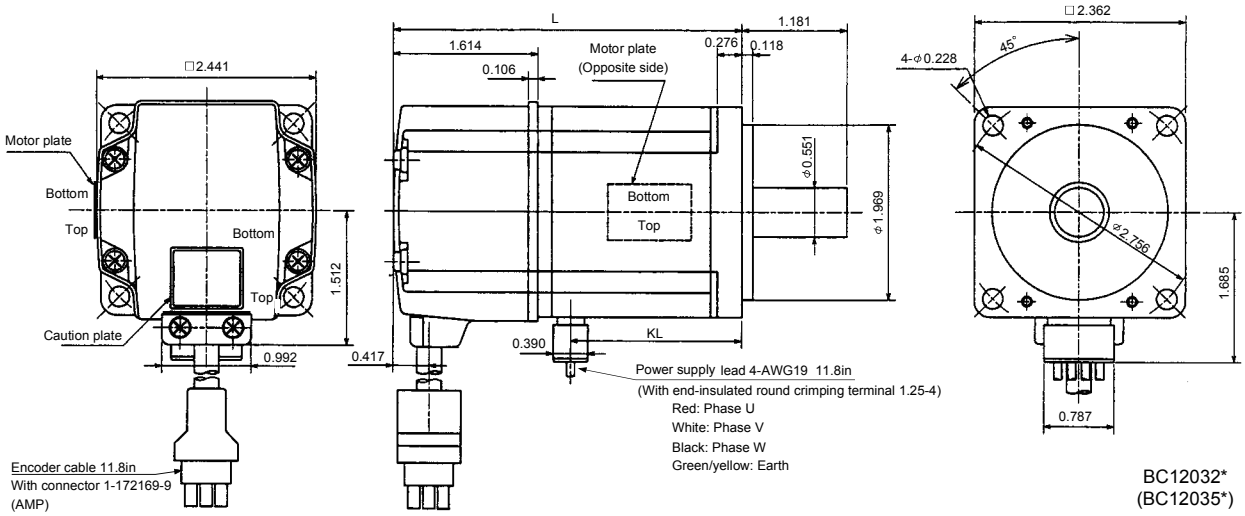
Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-MF053	50	3.21	1.16	0.10	0.9
HC-MF13	100	3.80	0.18	0.16	1.2
HC-KF053	50	3.21	0.12	0.29	0.9
HC-KF13	100	3.80	1.75	0.46	1.2

[Unit: in]



Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-MF23	200	3.92	1.93	0.48	2.2
HC-MF43	400	4.90	0.06	0.78	3.2
HC-KF23	200	3.92	1.93	1.422	2.2
HC-KF43	400	4.90	0.06	2.515	3.2

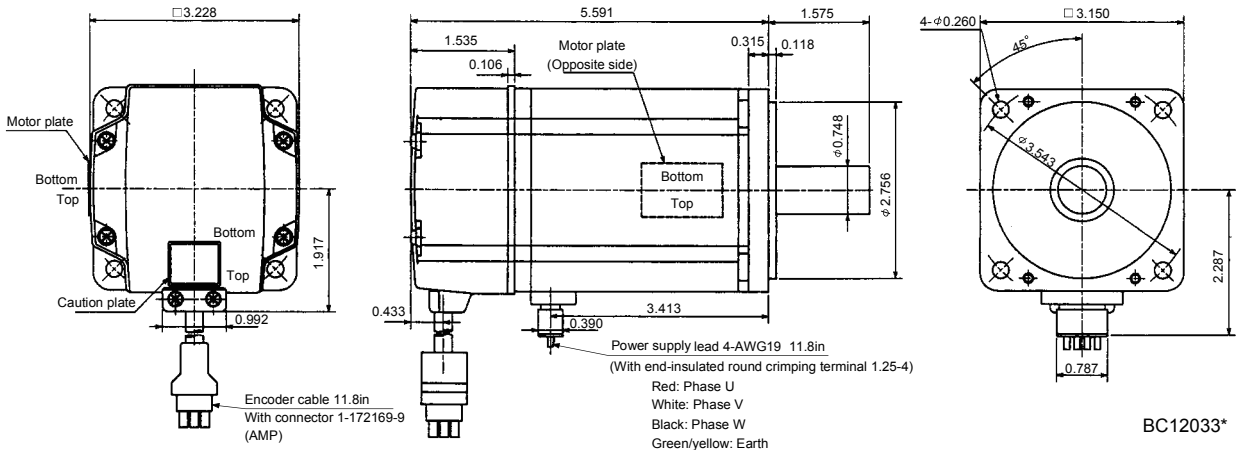
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-MF73	750	3.28	6.6

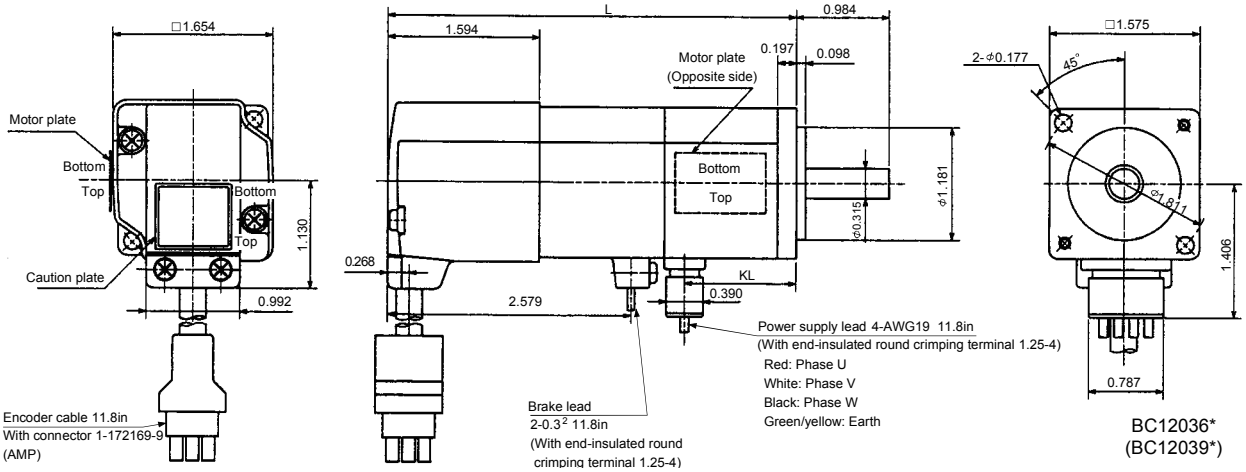
[Unit: in]



(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-MF053B	50	4.31	1.16	45.32	0.12	1.7
HC-MF13B	100	4.90	1.75	45.32	0.18	2.0
HC-KF053B	50	4.31	1.16	45.32	0.31	1.7
HC-KF13B	100	4.90	1.75	45.32	0.48	2.0

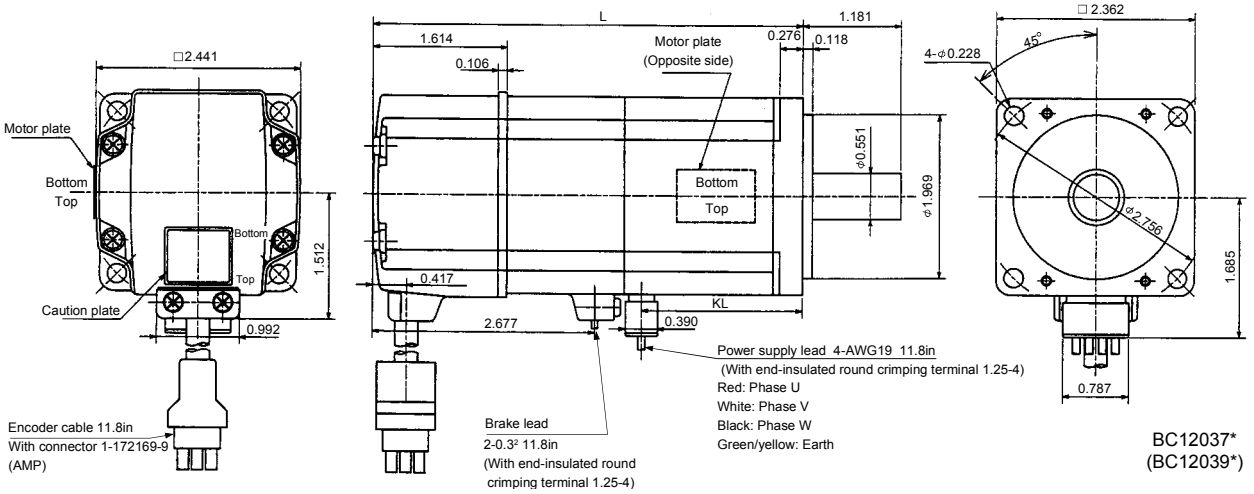
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-MF23B	200	5.18	1.93	184	0.74	3.5
HC-MF43B	400	6.16	2.84	184	1.04	4.6
HC-KF23B	200	5.18	1.93	184	1.694	3.5
HC-KF43B	400	6.16	2.84	184	2.788	4.6

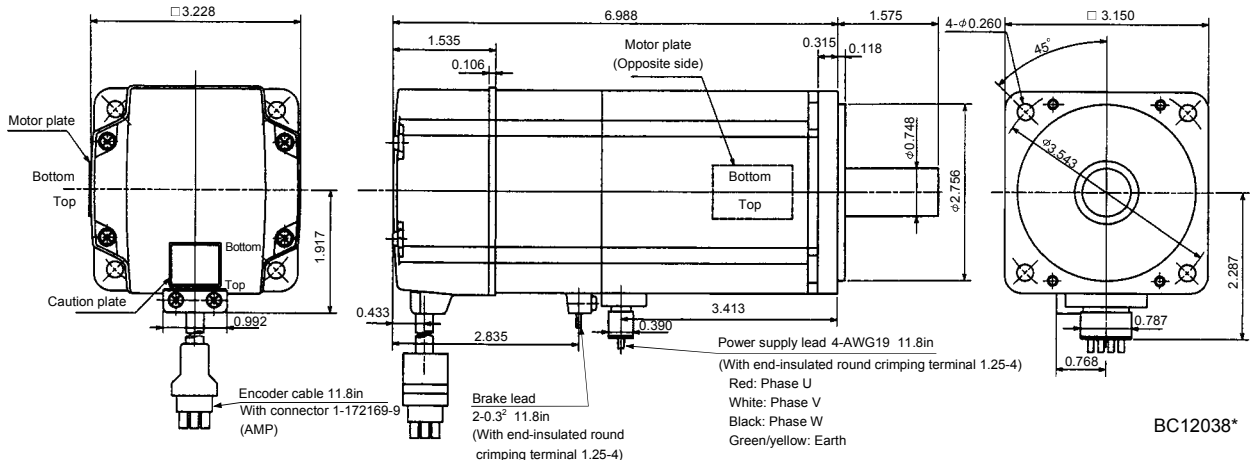
[Unit: in]



BC12037*
(BC12039*)

Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-MF73B	750	340	3.96	8.8

[Unit: in]



BC12038*

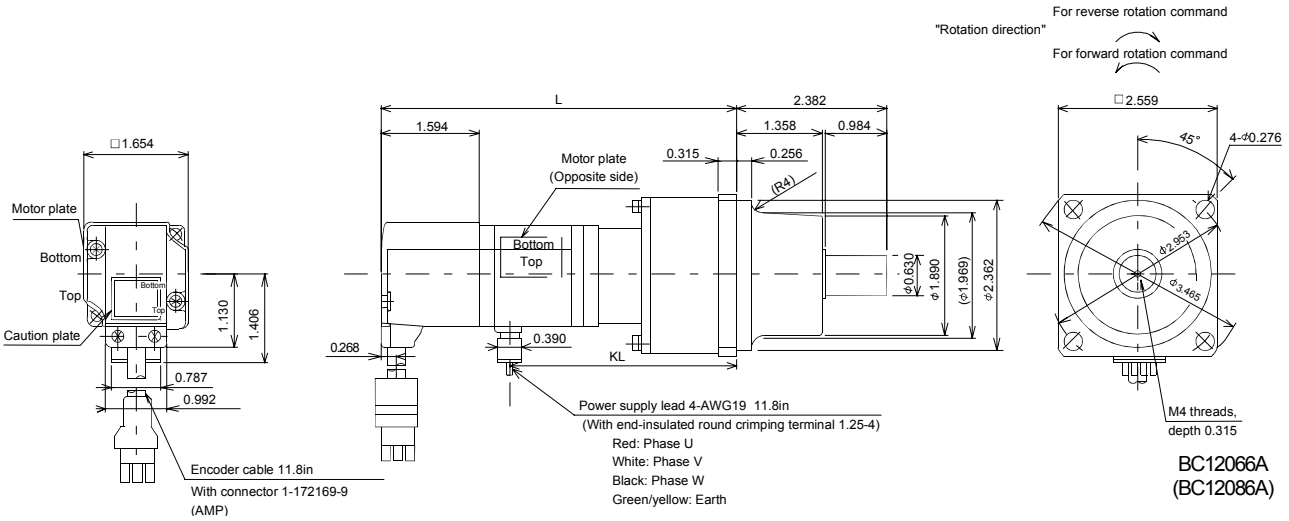
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL					
HC-MF053G1	50	4.96	2.91	K6505	1/5(9/44)	0.30	60min. max.	3.1
HC-MF053G1	50	5.669	3.62	K6512	1/12(49/576)	0.42	60min. max.	4.0
HC-MF053G1	50	5.669	3.62	K6520	1/20(25/484)	0.32	60min. max.	4.0
HC-KF053G1	50	4.96	2.91	K6505	1/5(9/44)	0.49	60min. max.	3.1
HC-KF053G1	50	5.669	3.62	K6512	1/12(49/576)	0.61	60min. max.	4.0
HC-KF053G1	50	5.669	3.62	K6520	1/20(25/484)	0.51	60min. max.	4.0

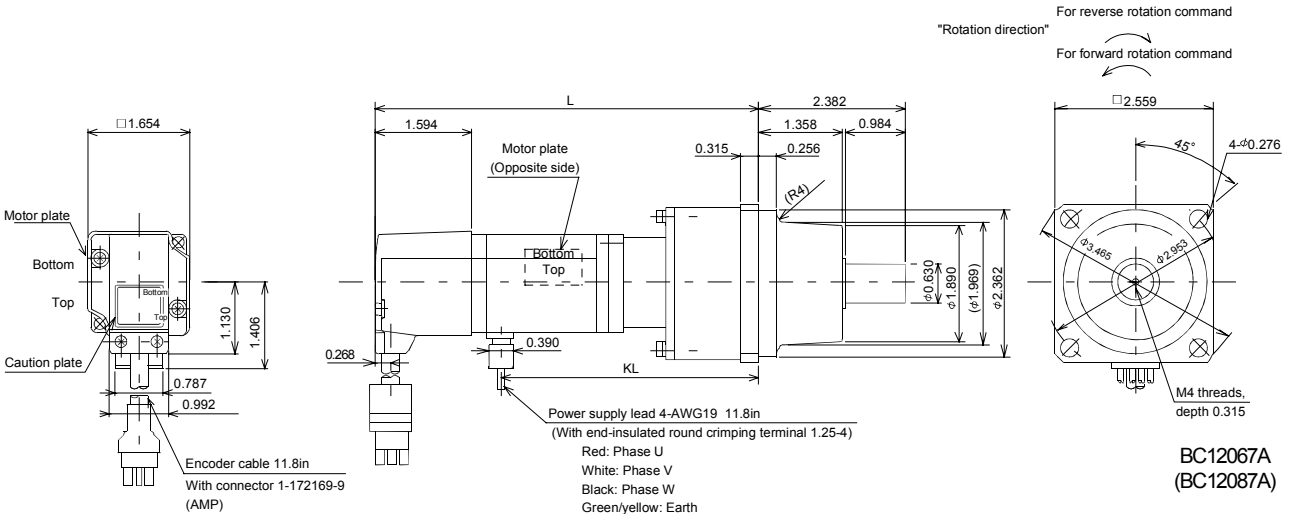
[Unit: in]



BC12066A
(BC12086A)

Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL					
HC-MF13G1	100	5.551	3.5	K6505	1/5(9/44)	0.36	60min. max.	3.3
HC-MF13G1	100	6.26	4.21	K6512	1/12(49/576)	0.48	60min. max.	4.2
HC-MF13G1	100	6.26	4.21	K6520	1/20(25/484)	0.38	60min. max.	4.2
HC-KF13G1	100	5.551	3.5	K6505	1/5(9/44)	0.66	60min. max.	3.3
HC-KF13G1	100	6.26	4.21	K6512	1/12(49/576)	0.78	60min. max.	4.2
HC-KF13G1	100	6.26	4.21	K6520	1/20(25/484)	0.68	60min. max.	4.2

[Unit: in]

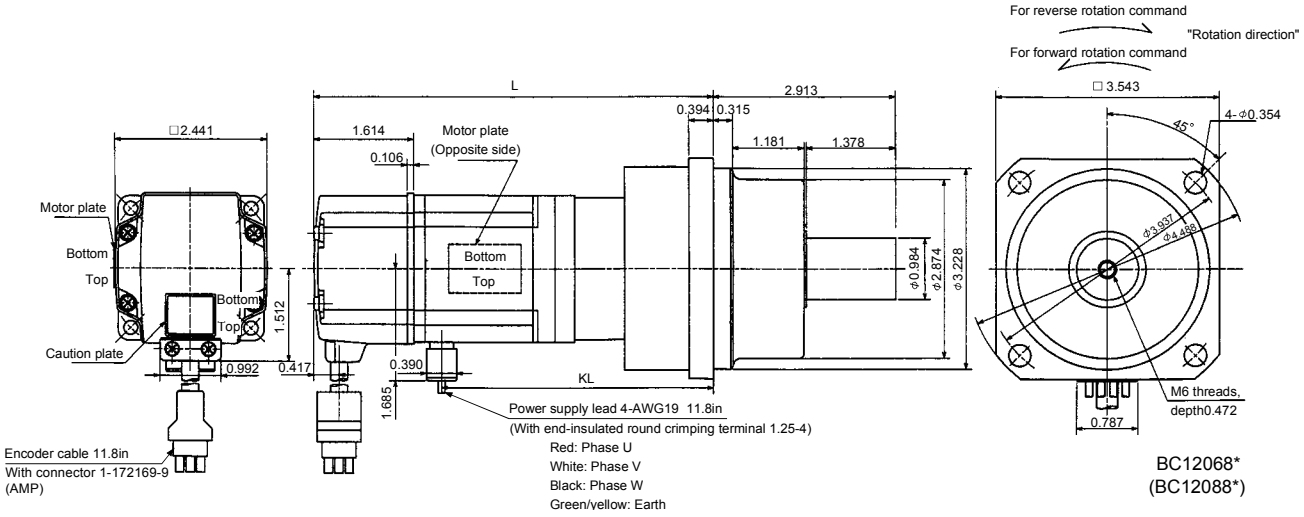


BC12067A
(BC12087A)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MF23G1	200	6.02	4.04	K9005	1/5(19/96)	1.36	7.3
HC-MF23G1	200	6.81	4.83	K9012	1/12(25/288)	1.60	8.6
HC-MF23G1	200	6.81	4.83	K9020	1/20(253/5000)	1.45	8.6
HC-KF23G1	200	6.02	4.04	K9005	1/5(19/96)	2.296	7.3
HC-KF23G1	200	6.81	4.83	K9012	1/12(25/288)	2.569	8.6
HC-KF23G1	200	6.81	4.83	K9020	1/20(253/5000)	2.406	8.6

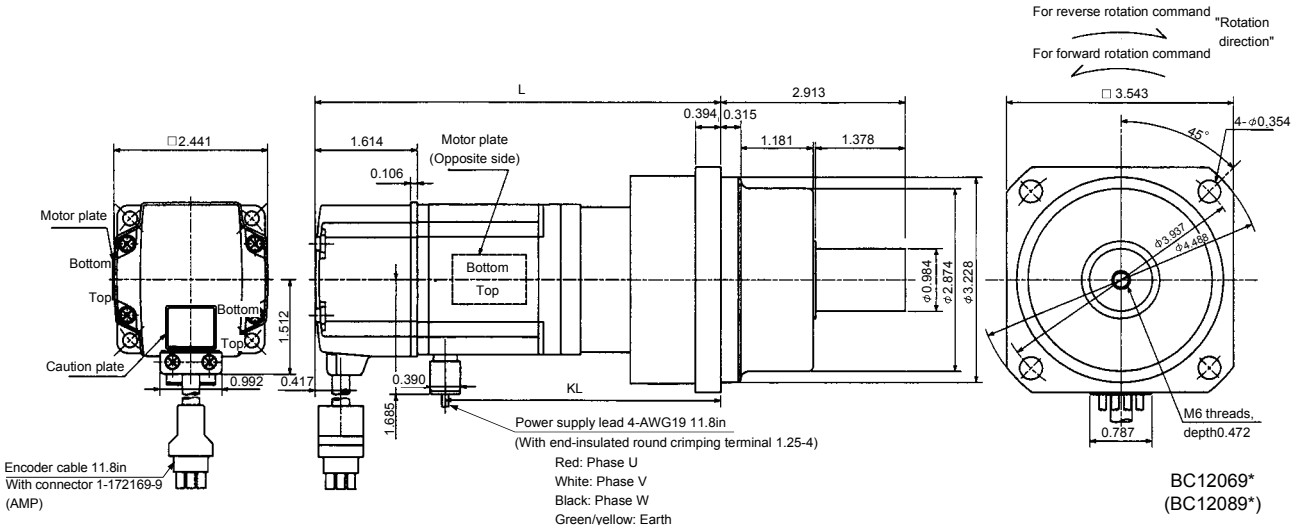
[Unit: in]



BC12068*
(BC12088*)

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MF43G1	400	7.01	4.95	K9005	1/5(19/96)	1.62	8.4
HC-MF43G1	400	7.80	5.73	K9012	1/12(25/288)	1.85	9.7
HC-KF43G1	400	7.01	4.95	K9005	1/5(19/96)	3.335	8.4
HC-KF43G1	400	7.80	5.73	K9012	1/12(25/288)	3.609	9.7

[Unit: in]



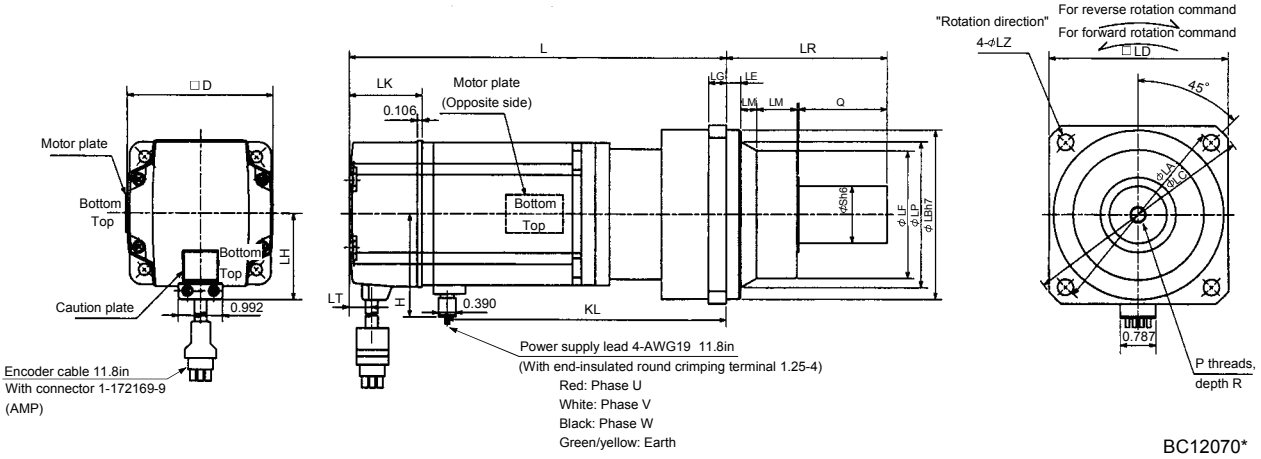
BC12069*
(BC12089*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-MF43G1	400	K10020	1/20	253/5000	3.57	60min. max.	12.13
HC-MF73G1	750	K10005	1/5	1/5	5.58	60min. max.	13.67
HC-MF73G1	750	K10012	1/12	525/6048	9.22	60min. max.	16.09
HC-MF73G1	750	K12020	1/20	625/12544	9.57	60min. max.	22.27

Model	Output [W]	Variable Dimensions [in]																					
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MF43G1	400	2.362	1.50	1.61	0.42	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	7.933	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-MF73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	8.15	3.54	5.97	0.35	1.97	1.26	M8	0.63
HC-MF73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.016	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-MF73G1	750	3.15	1.89	1.54	0.43	2.29	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	9.528	4.17	7.35	0.55	2.36	1.57	M10	0.79

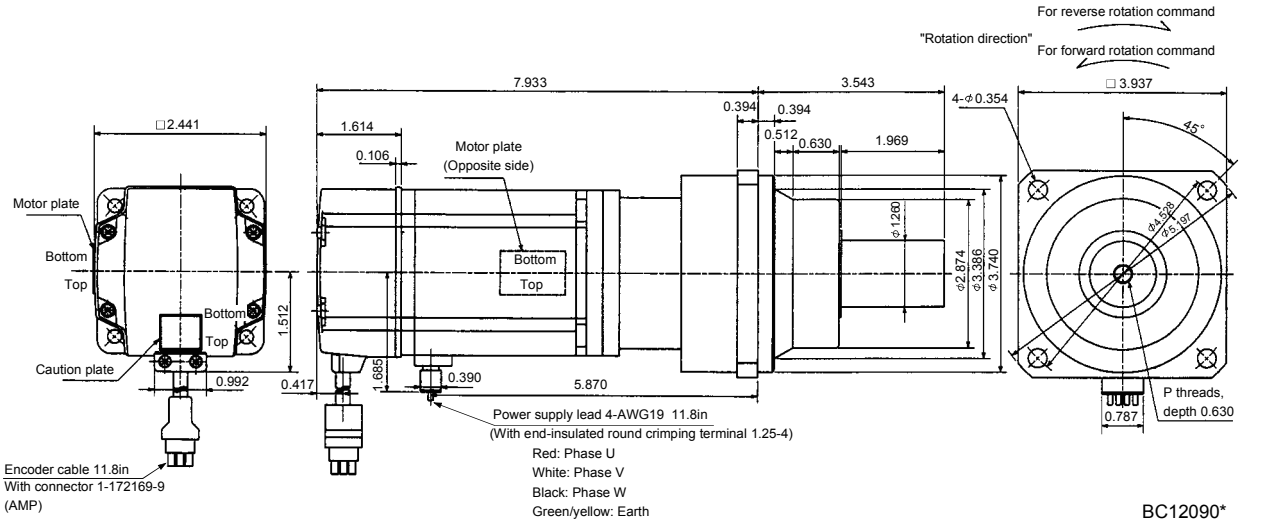
[Unit: in]



BC12070*

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-KF43G1	400	K10020	1/20	253/5000	5.303	60min. max.	12.13

[Unit: in]

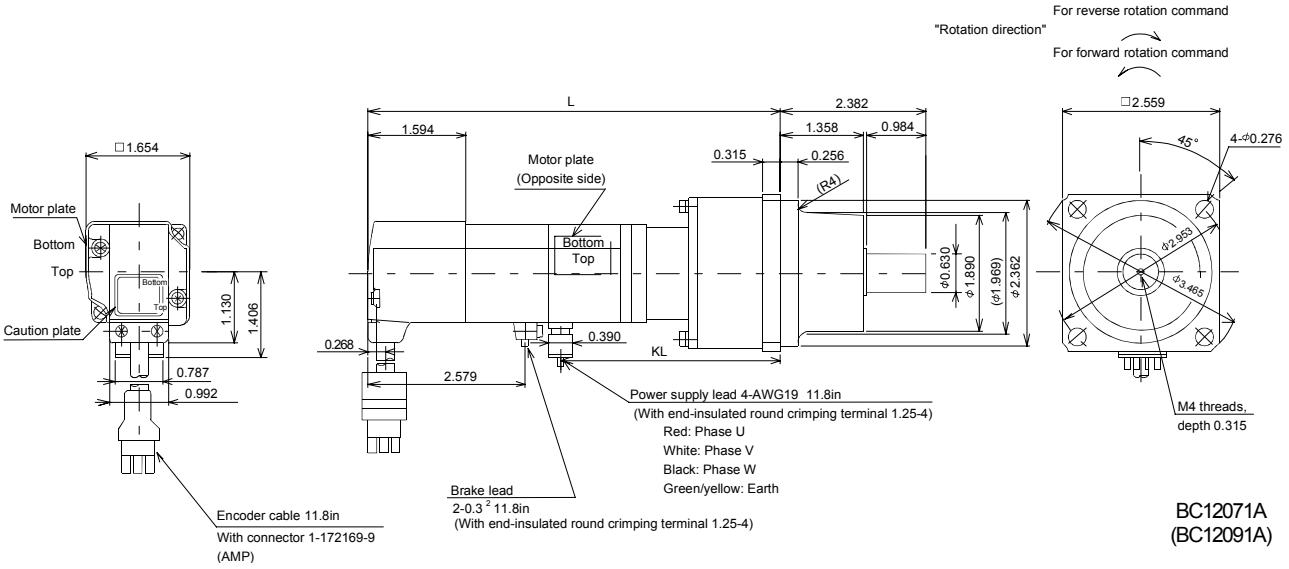


BC12090*

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL						
HC-MF053BG1	50	6.06	2.91	45	K6505	1/5(9/44)	0.32	60min. max.	4.0
HC-MF053BG1	50	6.77	3.62	45	K6512	1/12(49/576)	0.44	60min. max.	4.9
HC-MF053BG1	50	6.77	3.62	45	K6520	1/20(25/484)	0.34	60min. max.	4.9
HC-KF053BG1	50	6.02	2.91	45	K6505	1/5(9/44)	0.51	60min. max.	4.0
HC-KF053BG1	50	6.77	3.62	45	K6512	1/12(49/576)	0.63	60min. max.	4.9
HC-KF053BG1	50	6.77	3.62	45	K6520	1/20(25/484)	0.53	60min. max.	4.9

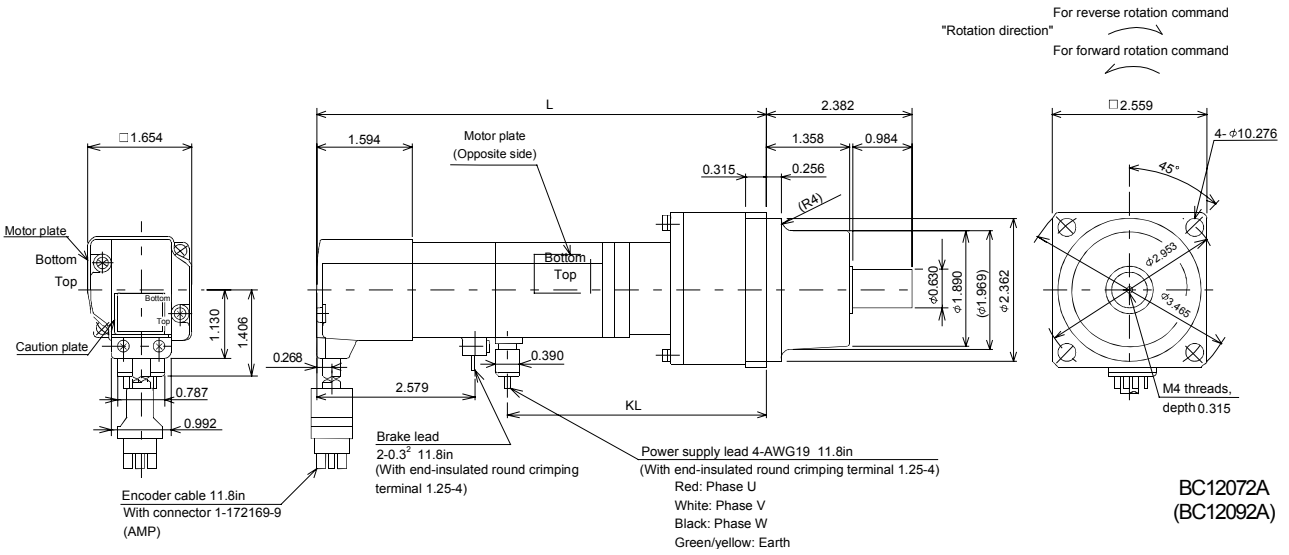
[Unit: in]



BC12071A
(BC12091A)

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL						
HC-MF13BG1	100	6.65	3.43	45	K6505	1/5(9/44)	0.38	60min. max.	4.2
HC-MF13BG1	100	7.36	4.21	45	K6512	1/12(49/576)	0.50	60min. max.	5.1
HC-MF13BG1	100	7.36	4.21	45	K6520	1/20(25/484)	0.40	60min. max.	5.1
HC-KF13BG1	100	6.65	3.43	45	K6505	1/5(9/44)	0.68	60min. max.	4.2
HC-KF13BG1	100	7.36	4.21	45	K6512	1/12(49/576)	0.80	60min. max.	5.1
HC-KF13BG1	100	7.36	4.21	45	K6520	1/20(25/484)	0.7	60min. max.	5.1

[Unit: in]

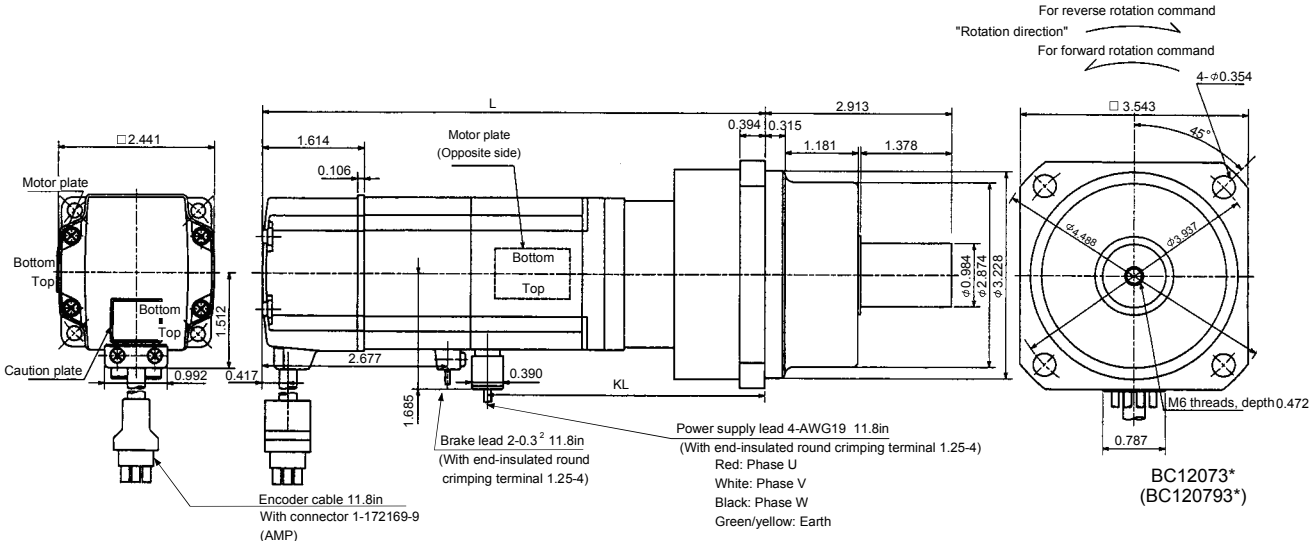


BC12072A
(BC12092A)

7. OUTLINE DIMENSION DRAWINGS

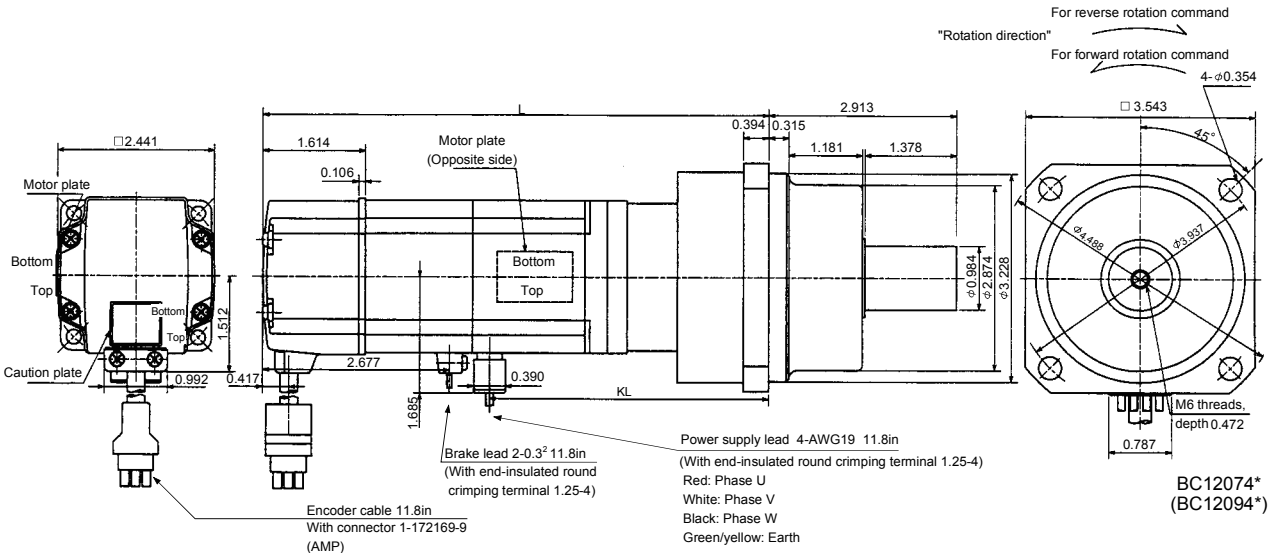
Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [oz・in]
		L	KL					
HC-MF23BG1	200	6.65	4.04	K9005	1/5(19/96)	1.58	8.6	184
HC-MF23BG1	200	7.36	4.23	K9012	1/12(25/288)	1.82	9.9	184
HC-MF23BG1	200	7.36	4.23	K9020	1/20(253/5000)	1.67	9.9	184
HC-KF23BG1	200	6.65	4.04	K9005	1/5(19/96)	2.569	8.6	184
HC-KF23BG1	200	7.36	4.23	K9012	1/12(25/288)	2.843	9.9	184
HC-KF23BG1	200	7.36	4.23	K9020	1/20(253/5000)	2.679	9.9	184

[Unit: in]



Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL					
HC-MF43BG1	400	8.27	4.95	184	K9005	1/5(19/96)	1.88	9.7
HC-MF43BG1	400	9.06	5.73	184	K9012	1/12(25/288)	2.12	11.0
HC-KF43BG1	400	8.27	4.95	184	K9005	1/5(19/96)	3.609	9.7
HC-KF43BG1	400	9.06	5.73	184	K9012	1/12(25/288)	3.882	11.0

[Unit: in]

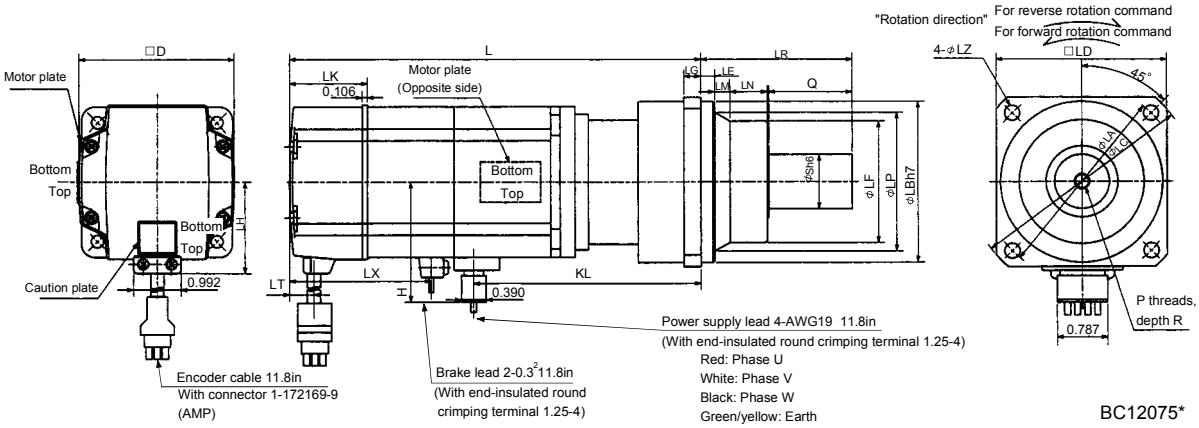


7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-MF43BG1	400	184	K10020	1/20	253/5000	3.83	60min. max.	13.4
HC-MF73BG1	750	340	K10005	1/5	1/5	6.26	60min. max.	15.9
HC-MF73BG1	750	340	K10012	1/12	525/6048	9.90	60min. max.	18.3
HC-MF73BG1	750	340	K12020	1/20	625/12544	10.25	60min. max.	25.8

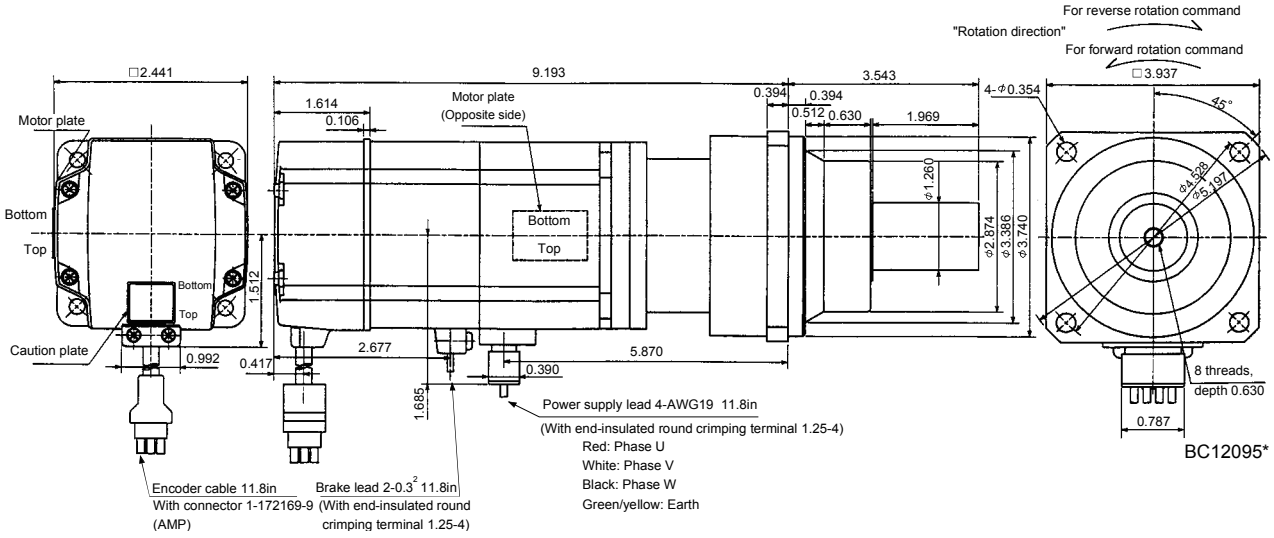
Model	Output [W]	Variable Dimensions [in]																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MF43BG1	400	2.44	1.51	1.64	0.14	2.68	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.19	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-MF73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.55	3.54	5.92	0.35	1.97	1.26	M8	0.63
HC-MF73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	10.41	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-MF73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	10.93	4.17	7.35	0.55	2.36	1.57	M10	0.79

[Unit: in]



Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-KF43BG1	400	184	K10020	1/20	253/5000	5.577	60min. max.	13.4

[Unit: in]



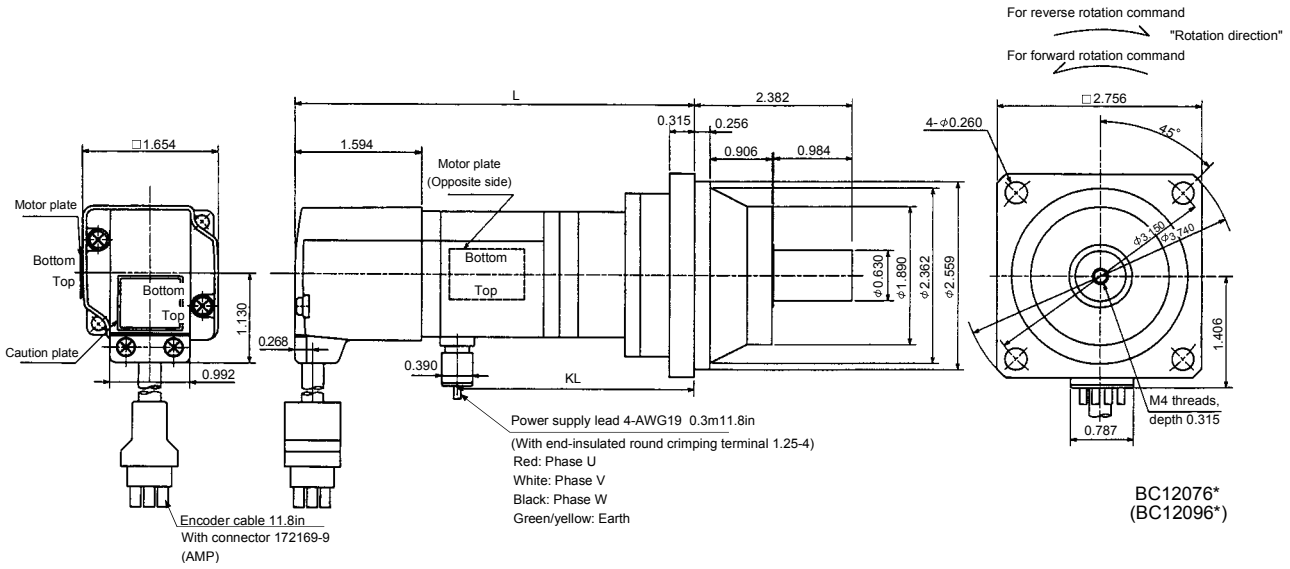
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
		L	KL					
HC-MF053G2	50	5.12	3.07	BK1-05B-A5MEKA	1/5	0.36	3 min. max.	3.1
HC-MF053G2	50	5.75	3.70	BK1-09B-A5MEKA	1/9	0.33	3 min. max.	3.7
HC-MF053G2	50	5.75	3.70	BK1-20B-A5MEKA	1/20	0.38	3 min. max.	4.0
HC-MF053G2	50	5.75	3.70	BK1-29B-A5MEKA	1/29	0.31	3 min. max.	4.0
HC-KF053G2	50	5.12	3.07	BK1-05B-A5MEKA	1/5	0.55	3 min. max.	3.1
HC-KF053G2	50	5.75	3.70	BK1-09B-A5MEKA	1/9	0.52	3 min. max.	3.7
HC-KF053G2	50	5.75	3.70	BK1-20B-A5MEKA	1/20	0.57	3 min. max.	4.0
HC-KF053G2	50	5.75	3.70	BK1-29B-A5MEKA	1/29	0.50	3 min. max.	4.0

[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

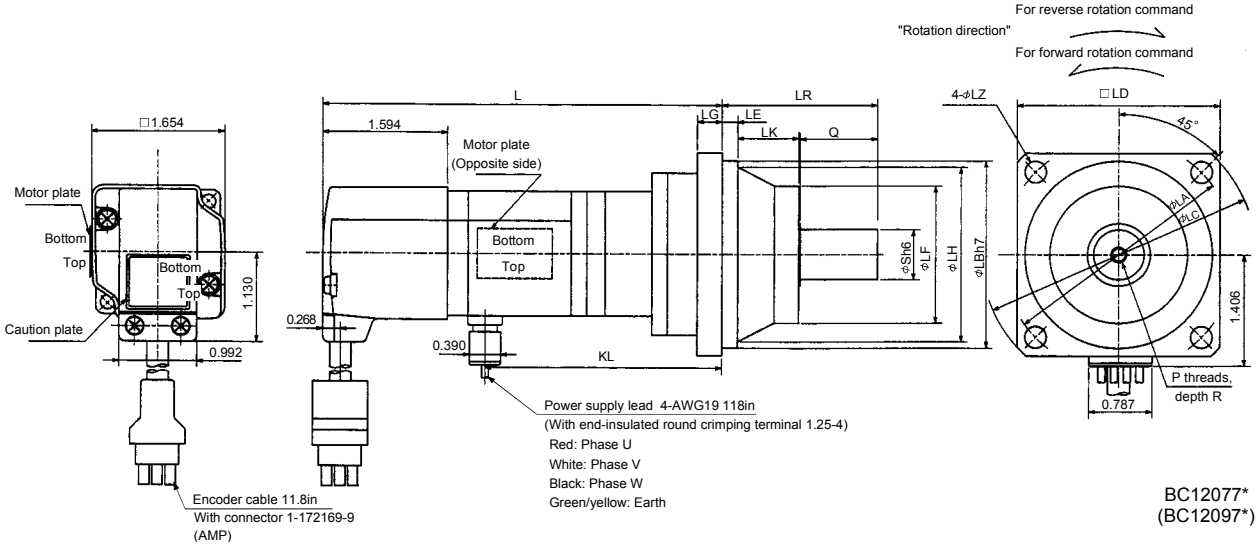
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HC-MF13G2	100	BK1-05B-01MEKA	1/5	0.43	3 min. max.	3.3
HC-MF13G2	100	BK1-09B-01MEKA	1/9	0.39	3 min. max.	4.0
HC-MF13G2	100	BK2-20B-01MEKA	1/20	0.66	3 min. max.	6.6
HC-MF13G2	100	BK2-29B-01MEKA	1/29	0.52	3 min. max.	6.6

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	5.71	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-MF13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.34	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-MF13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-MF13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HC-KF13G2	100	BK1-05B-01MEKA	1/5	0.72	3 min. max.	3.3
HC-KF13G2	100	BK1-09B-01MEKA	1/9	0.69	3 min. max.	4.0
HC-KF13G2	100	BK2-20B-01MEKA	1/20	0.96	3 min. max.	6.6
HC-KF13G2	100	BK2-29B-01MEKA	1/29	0.82	3 min. max.	6.6

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	5.71	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-KF13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.34	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-KF13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-KF13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39

[Unit: in]



BC12077*
(BC12097*)

7. OUTLINE DIMENSION DRAWINGS

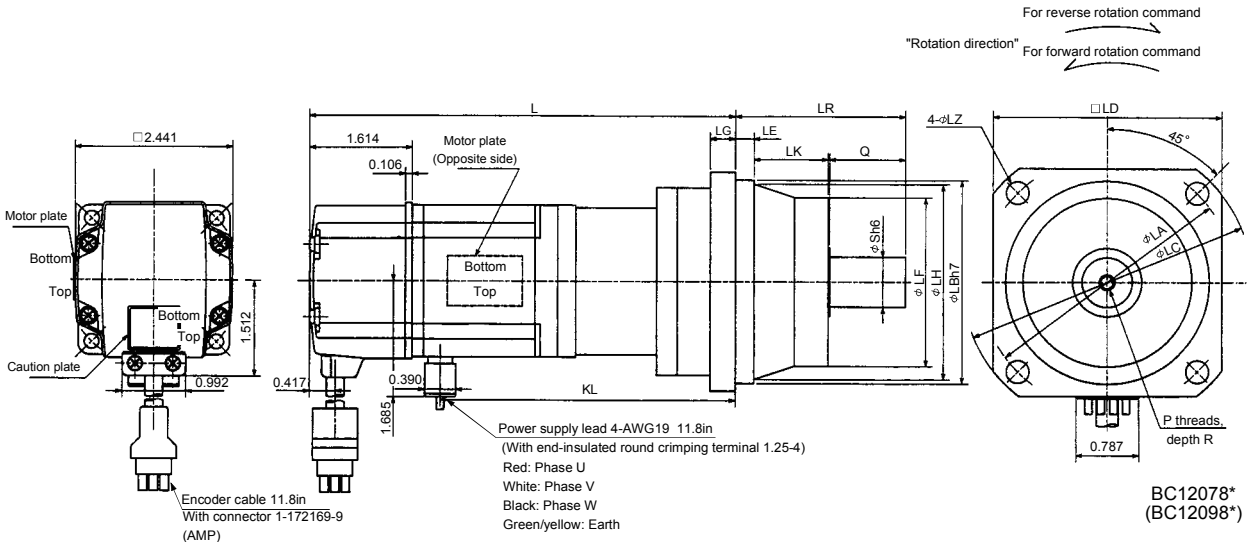
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MF23G2	200	BK1-05B-02MEKA	1/5	1.04	4.6
HC-MF23G2	200	BK2-09B-02MEKA	1/9	1.14	7.7
HC-MF23G2	200	BK3-20B-02MEKA	1/20	1.95	11.0
HC-MF23G2	200	BK3-29B-02MEKA	1/29	1.51	11.0

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF23G2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.18	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-MF23G2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.89	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-MF23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-MF23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KF23G2	200	BK1-05B-02MEKA	1/5	1.968	4.6
HC-KF23G2	200	BK2-09B-02MEKA	1/9	2.078	7.7
HC-KF23G2	200	BK3-20B-02MEKA	1/20	2.898	11.0
HC-KF23G2	200	BK3-29B-02MEKA	1/29	2.460	11.0

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF23G2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.18	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-KF23G2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.89	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-KF23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-KF23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47

[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

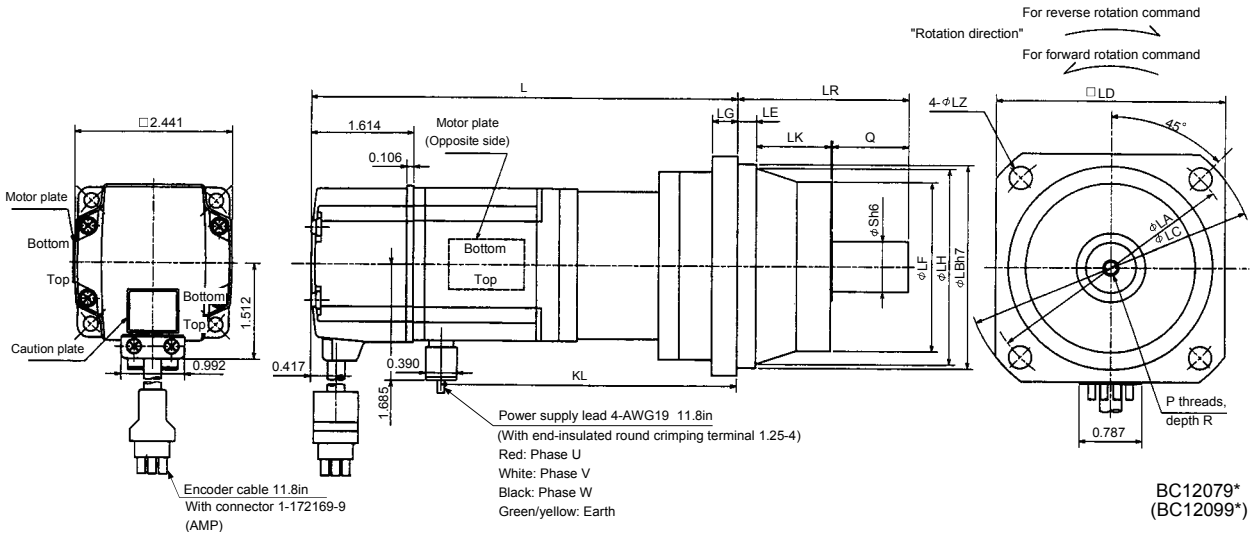
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-MF43G2	400	BK2-05B-04MEKA	1/5	1.61	8.2
HC-MF43G2	400	BK3-09B-04MEKA	1/9	1.77	11.7
HC-MF43G2	400	BK4-20B-04MEKA	1/20	2.33	16.5
HC-MF43G2	400	BK4-29B-04MEKA	1/29	1.85	16.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF43G2	400	3.94	3.15	4.53	3.35	0.24	2.56	0.39	2.91	1.3	7.24	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-MF43G2	400	4.53	3.74	5.32	3.94	0.31	2.95	0.39	3.35	1.38	8.07	3.35	6.01	0.35	1.58	0.98	M6	0.47
HC-MF43G2	400	5.32	3.94	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-MF43G2	400	5.32	4.33	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.97	1.26	M8	0.63

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-KF43G2	400	BK2-05B-04MEKA	1/5	3.335	8.2
HC-KF43G2	400	BK3-09B-04MEKA	1/9	3.499	11.7
HC-KF43G2	400	BK4-20B-04MEKA	1/20	4.046	16.5
HC-KF43G2	400	BK4-29B-04MEKA	1/29	3.609	16.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF43G2	400	3.94	3.15	4.53	3.35	0.24	2.56	0.39	2.91	1.3	7.24	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-KF43G2	400	4.53	3.74	5.32	3.94	0.31	2.95	0.39	3.35	1.38	8.07	3.35	6.01	0.35	1.58	0.98	M6	0.47
HC-KF43G2	400	5.32	3.94	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-KF43G2	400	5.32	4.33	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.97	1.26	M8	0.63

[Unit: in]



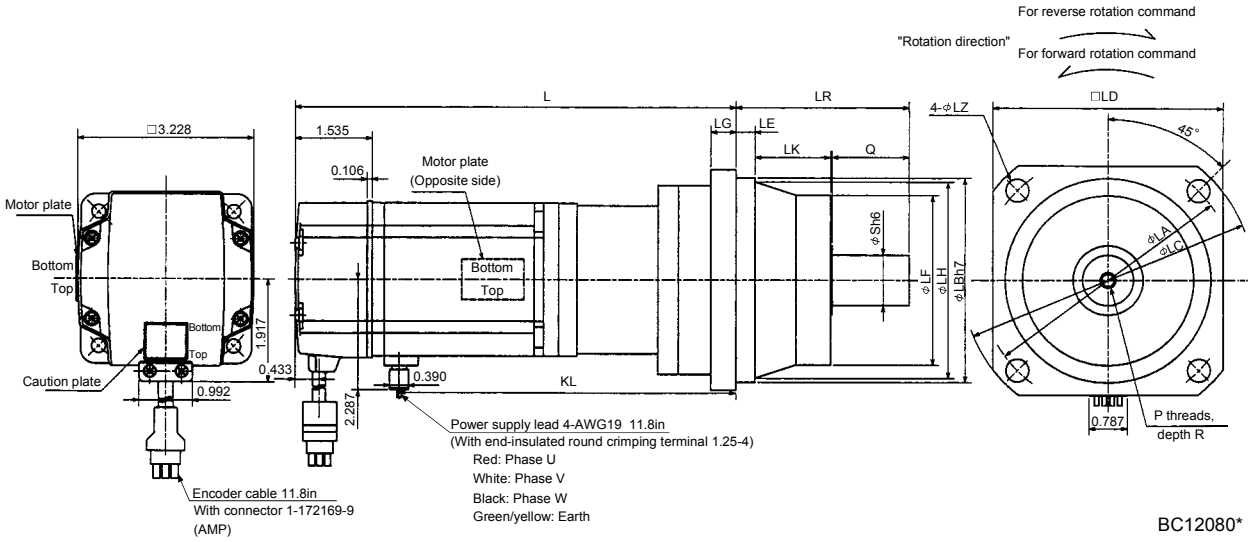
BC12079*
(BC12099*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-MF73G2	750	BK3-05B-08MEKA	1/5	5.32	13.89
HC-MF73G2	750	BK4-09B-08MEKA	1/9	5.36	18.96
HC-MF73G2	750	BK5-20B-08MEKA	1/20	5.55	26.46
HC-MF73G2	750	BK5-29B-08MEKA	1/29	4.97	26.46

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF73G2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-MF73G2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.76	3.94	7.27	0.43	1.97	1.26	M8	0.63
HC-MF73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-MF73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79

[Unit: in]

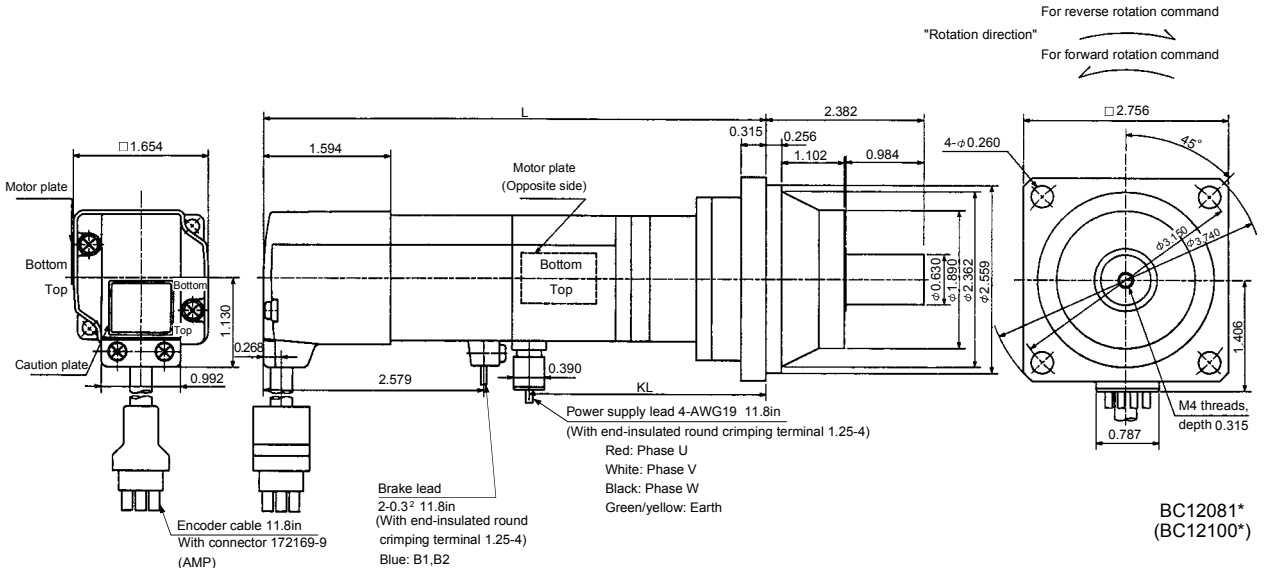


BC12080*

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL						
HC-MF053BG2	50	6.22	3.07	45	BK1-05B-A5MEKA	1/5	0.38	3 min. max.	4.0
HC-MF053BG2	50	6.85	3.70	45	BK1-09B-A5MEKA	1/9	0.34	3 min. max.	4.6
HC-MF053BG2	50	6.85	3.70	45	BK1-20B-A5MEKA	1/20	0.39	3 min. max.	4.9
HC-MF053BG2	50	6.85	3.70	45	BK1-29B-A5MEKA	1/29	0.33	3 min. max.	4.9
HC-KF053BG2	50	6.22	3.07	45	BK1-05B-A5MEKA	1/5	0.57	3 min. max.	4.0
HC-KF053BG2	50	6.85	3.70	45	BK1-09B-A5MEKA	1/9	0.54	3 min. max.	4.6
HC-KF053BG2	50	6.85	3.70	45	BK1-20B-A5MEKA	1/20	0.59	3 min. max.	4.9
HC-KF053BG2	50	6.85	3.70	45	BK1-29B-A5MEKA	1/29	0.52	3 min. max.	4.9

[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

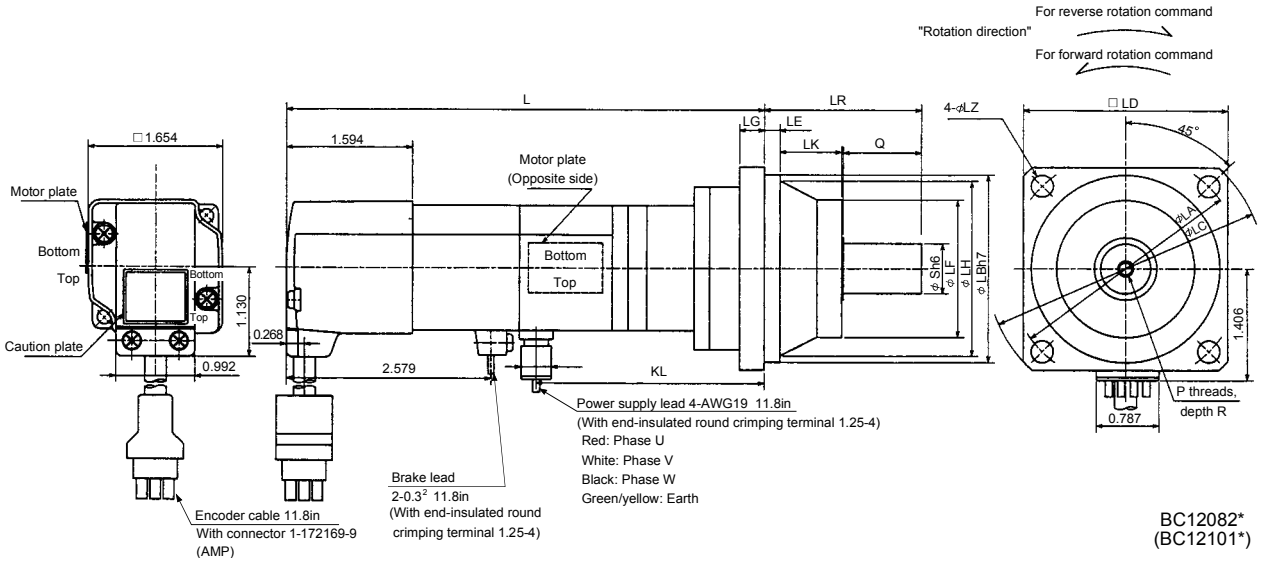
Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HC-MF13BG2	100	45	BK1-05B-01MEKA	1/5	0.44	3 min. max.	4.2
HC-MF13BG2	100	45	BK1-09B-01MEKA	1/9	0.40	3 min. max.	4.9
HC-MF13BG2	100	45	BK2-20B-01MEKA	1/20	0.68	3 min. max.	7.5
HC-MF13BG2	100	45	BK2-29B-01MEKA	1/29	0.53	3 min. max.	7.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.81	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-MF13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-MF13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-MF13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39

Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HC-KF13BG2	100	45	BK1-05B-01MEKA	1/5	0.74	3 min. max.	4.2
HC-KF13BG2	100	45	BK1-09B-01MEKA	1/9	0.71	3 min. max.	4.9
HC-KF13BG2	100	45	BK2-20B-01MEKA	1/20	0.98	3 min. max.	7.5
HC-KF13BG2	100	45	BK2-29B-01MEKA	1/29	0.84	3 min. max.	7.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.81	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-KF13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-KF13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-KF13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39

[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

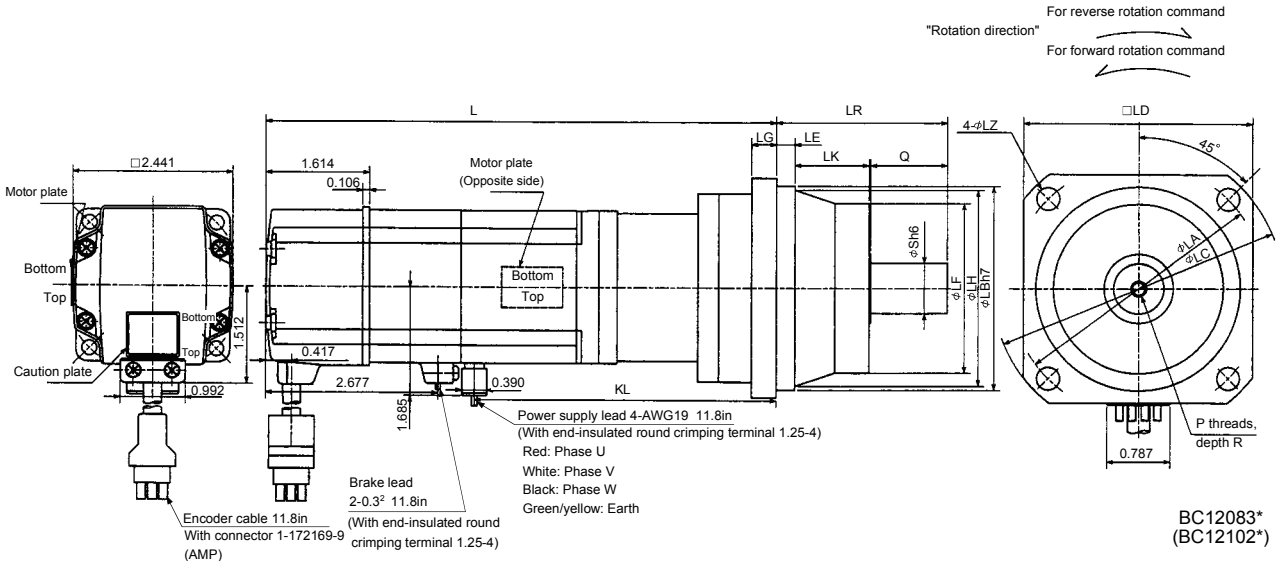
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MF23BG2	200	184	BK1-05B-02MEKA	1/5	1.31	6.0
HC-MF23BG2	200	184	BK2-09B-02MEKA	1/9	1.40	9.0
HC-MF23BG2	200	184	BK3-20B-02MEKA	1/20	2.21	12.3
HC-MF23BG2	200	184	BK3-29B-02MEKA	1/29	1.77	12.3

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF23BG2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-MF23BG2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.15	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-MF23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-MF23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KF23BG2	200	184	BK1-05B-02MEKA	1/5	2.242	6.0
HC-KF23BG2	200	184	BK2-09B-02MEKA	1/9	2.351	9.0
HC-KF23BG2	200	184	BK3-20B-02MEKA	1/20	3.171	12.3
HC-KF23BG2	200	184	BK3-29B-02MEKA	1/29	2.734	12.3

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF23BG2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-KF23BG2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.15	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-KF23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-KF23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47

[Unit: in]



BC12083*
(BC12102*)

7. OUTLINE DIMENSION DRAWINGS

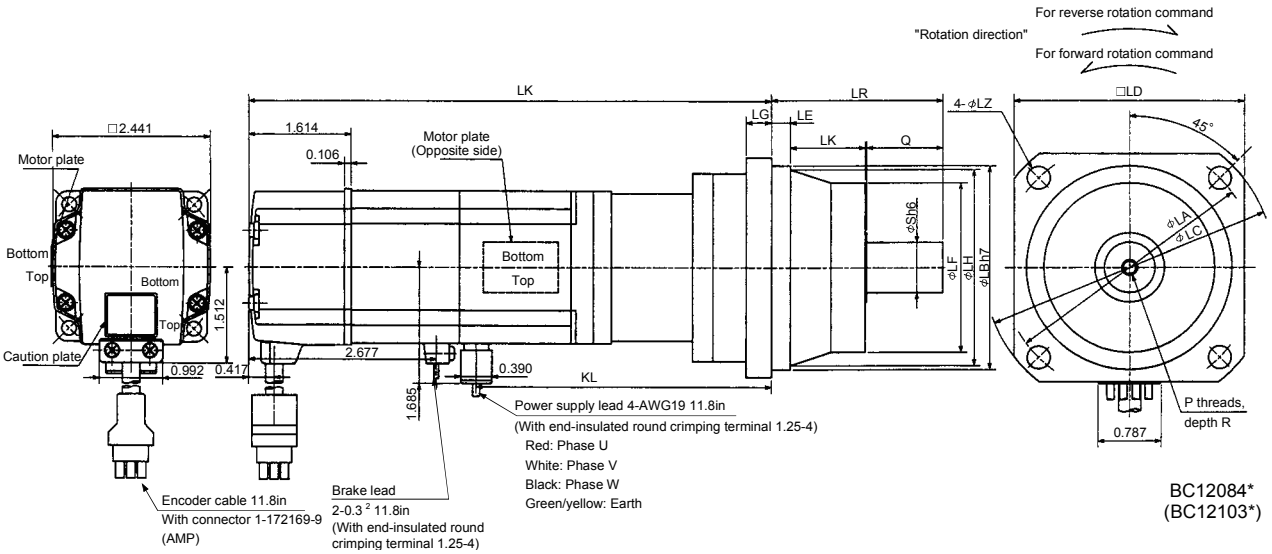
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MF43BG2	400	184	BK2-05B-04MEKA	1/5	1.88	9.5
HC-MF43BG2	400	184	BK3-09B-04MEKA	1/9	2.03	13.0
HC-MF43BG2	400	184	BK4-20B-04MEKA	1/20	2.59	17.9
HC-MF43BG2	400	184	BK4-29B-04MEKA	1/29	2.11	17.9

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF43BG2	400	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.50	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-MF43BG2	400	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.33	3.35	6.01	0.35	1.57	0.98	M6	0.47
HC-MF43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-MF43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KF43BG2	400	184	BK2-05B-04MEKA	1/5	3.609	9.5
HC-KF43BG2	400	184	BK3-09B-04MEKA	1/9	3.773	13.0
HC-KF43BG2	400	184	BK4-20B-04MEKA	1/20	4.319	17.9
HC-KF43BG2	400	184	BK4-29B-04MEKA	1/29	3.882	17.9

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KF43BG2	400	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.50	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-KF43BG2	400	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.33	3.35	6.01	0.35	1.57	0.98	M6	0.47
HC-KF43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-KF43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63

[Unit: in]

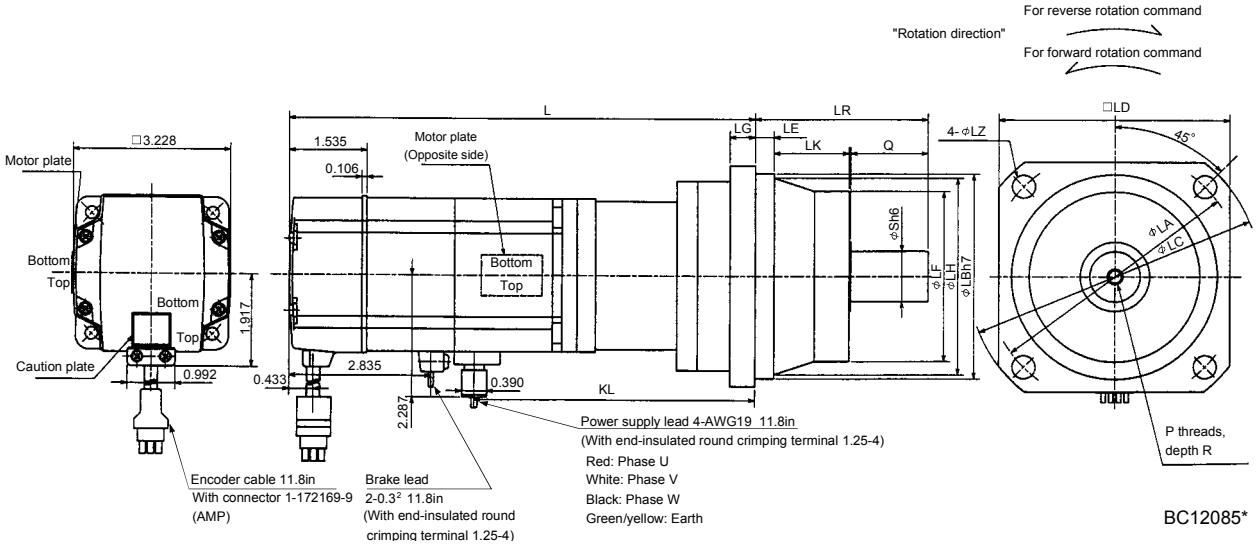


7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HC-MF73BG2	750	340	BK3-05B-08MEKA	1/5	6.00	16.1
HC-MF73BG2	750	340	BK4-09B-08MEKA	1/9	6.04	21.2
HC-MF73BG2	750	340	BK5-20B-08MEKA	1/20	6.24	28.7
HC-MF73BG2	750	340	BK5-29B-08MEKA	1/29	5.66	28.7

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MF73BG2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.74	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-MF73BG2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	10.85	3.94	7.27	0.43	1.97	1.26	M8	0.63
HC-MF73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-MF73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79

[Unit: in]

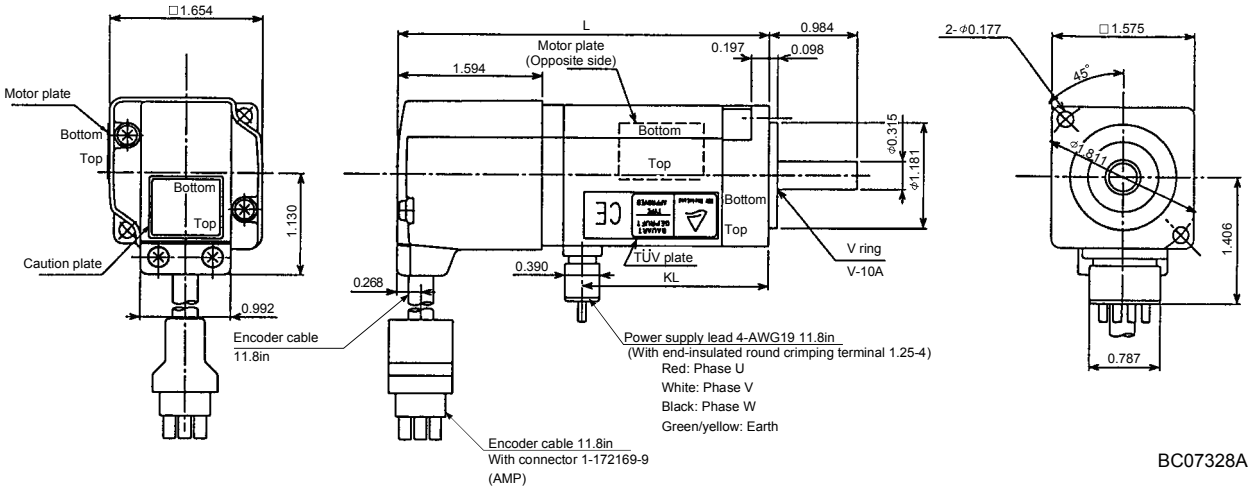


(5) EN・UL/C-UL Standard-compliant models

(a) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL		
HC-MF053-UE	50	3.52	1.48	0.10	1.1
HC-MF13-UE	100	4.11	2.07	0.16	1.3
HC-KF053-UE	50	3.52	1.48	0.30	1.1
HC-KF13-UE	100	4.11	2.07	0.47	1.3

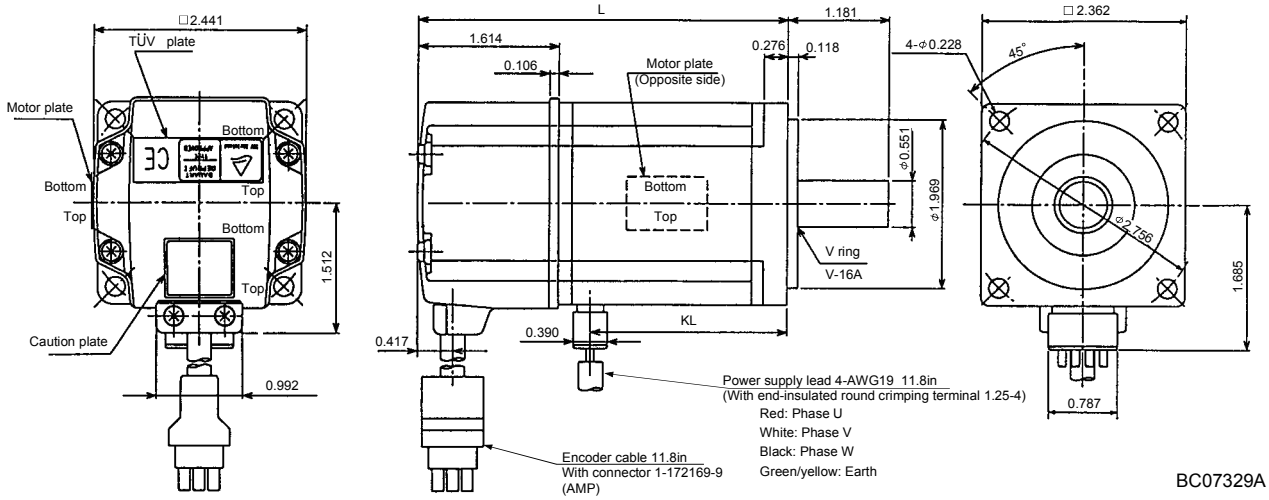
[Unit: in]



BC07328A

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL		
HC-MF23-UE	200	4.27	2.28	0.49	2.6
HC-MF43-UE	400	5.26	3.19	0.77	3.7
HC-KF23-UE	200	4.27	2.28	1.476	2.6
HC-KF43-UE	400	5.26	3.19	2.569	3.7

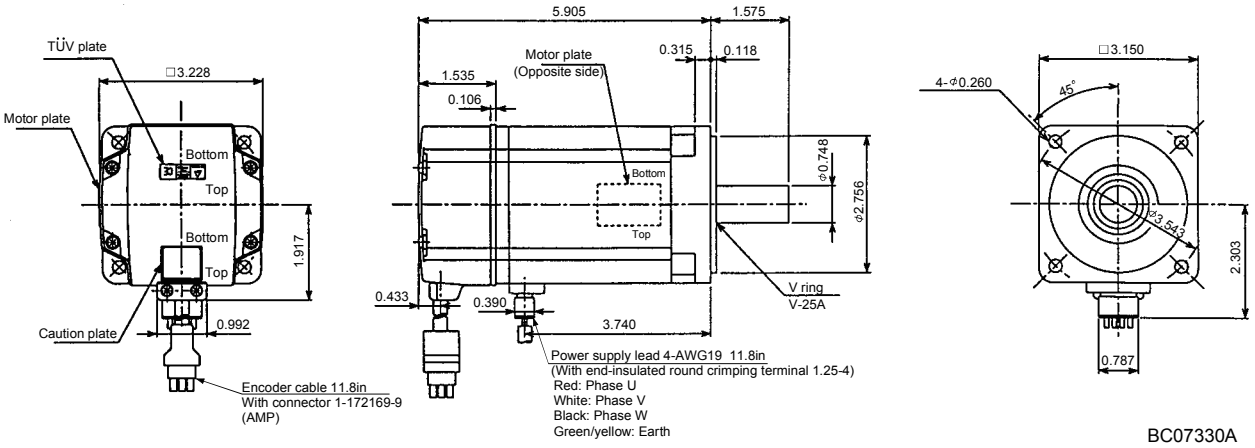
[Unit: in]



BC07329A

Model	Output [W]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HC-MF73-UE	750	3.69	6.8

[Unit: in]

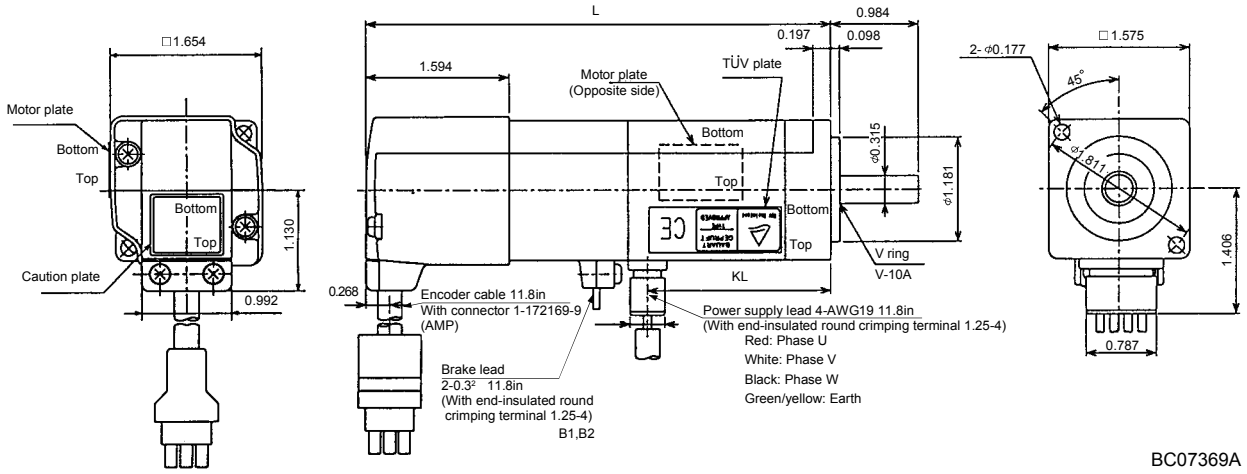


BC07330A

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL			
HC-MF053B-UE	50	4.63	1.48	45	0.12	2.0
HC-MF13B-UE	100	5.22	2.08	45	0.18	2.2
HC-KF053B-UE	50	4.63	1.48	45	0.31	2.0
HC-KF13B-UE	100	5.22	2.08	45	0.48	2.2

[Unit: in]

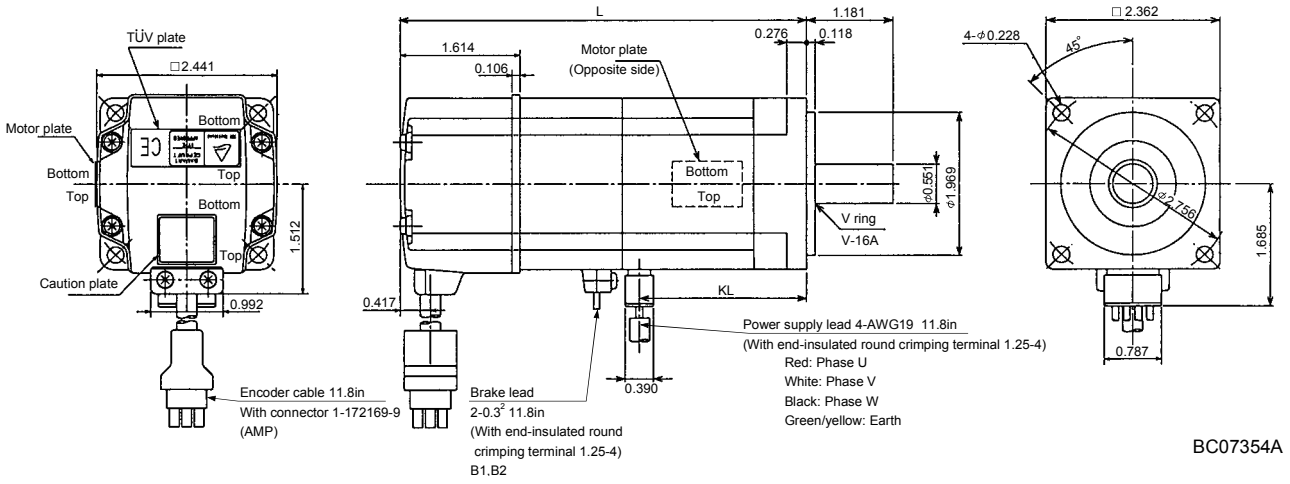


BC07369A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-MF23B-UE	200	5.53	2.28	184	0.47	3.7
HC-MF43B-UE	400	6.52	3.19	184	1.04	4.9
HC-KF23B-UE	200	5.53	2.28	184	1.749	3.7
HC-KF43B-UE	400	6.52	3.19	184	2.843	4.9

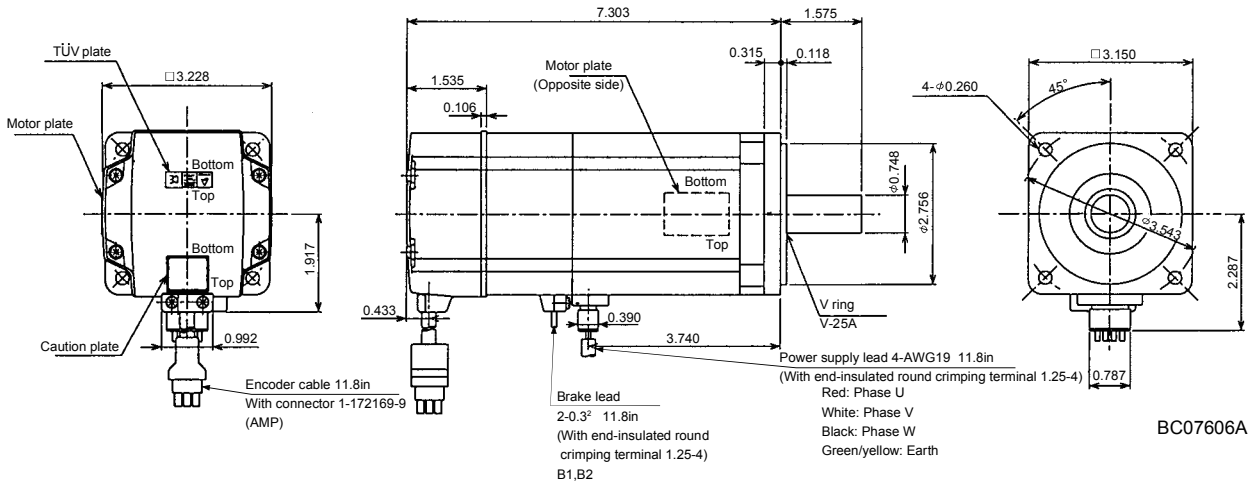
[Unit: in]



BC07354A

Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-MF73B-UE	750	340	4.10	9.3

[Unit: in]



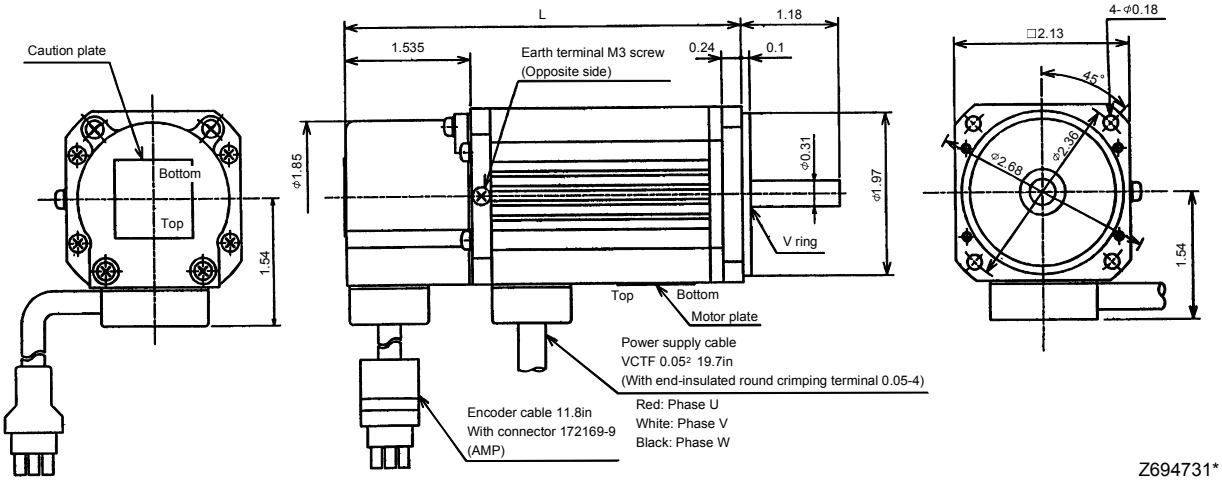
BC07606A

7.2.2 HA-FF series

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions [in] L	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-FF053	50	4.17	0.34	2.9
HA-FF13	100	4.84	0.55	3.3

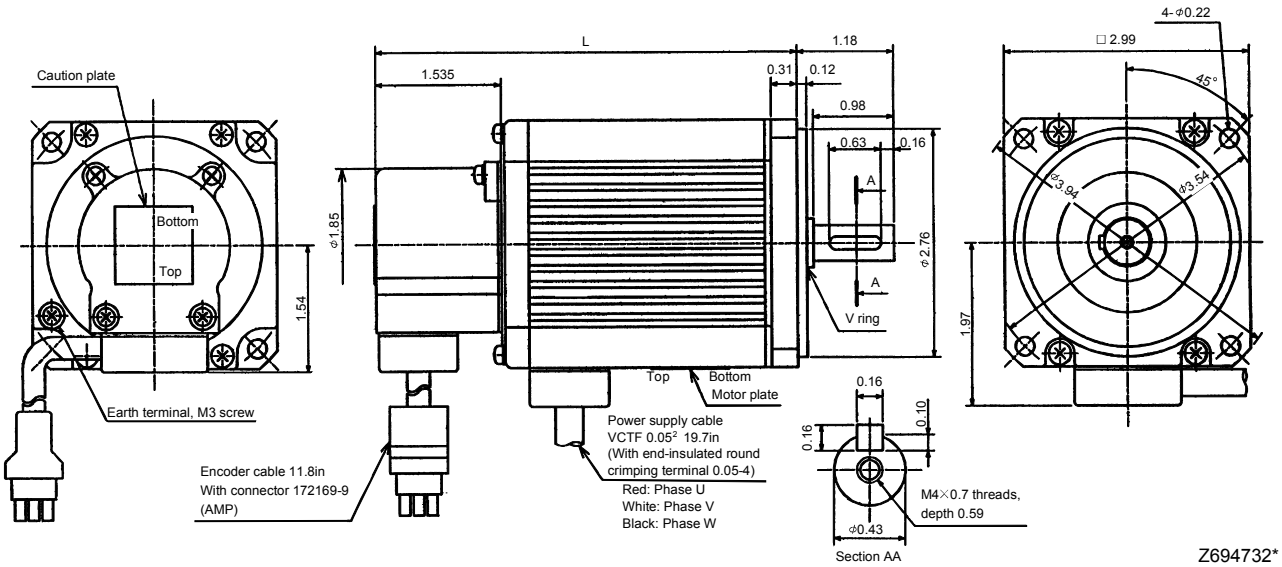
[Unit: in]



Z694731*

Model	Output [W]	Variable Dimensions [in] L	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-FF23	200	5.138	1.91	5.1
HA-FF33	300	5.83	2.73	5.7

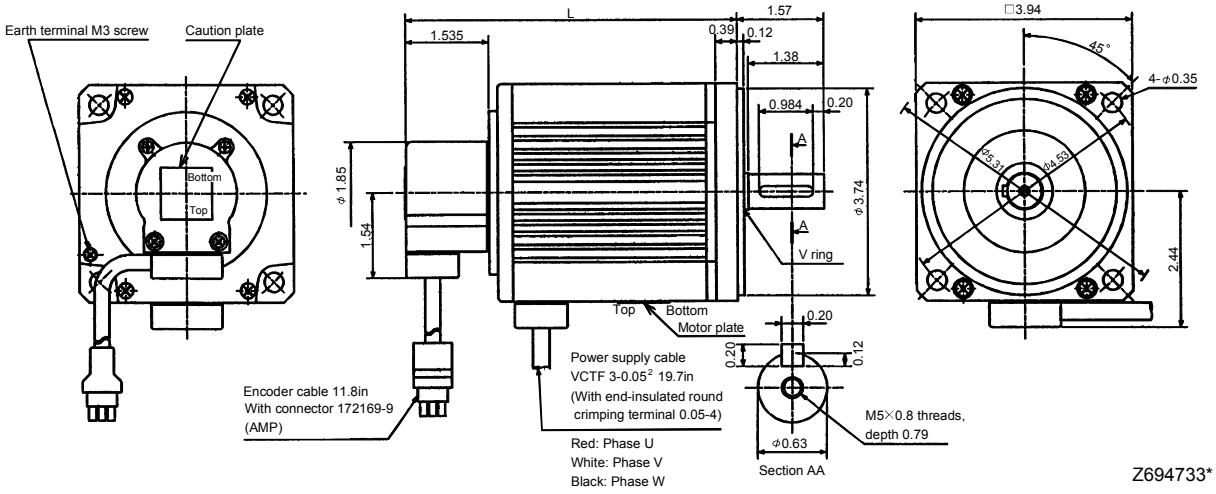
[Unit: in]



Z694732*

Model	Output [W]	Variable Dimensions [in] L	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HA-FF43	400	6.08	5.36	9.3
HA-FF63	600	6.67	6.56	10.6

[Unit: in]

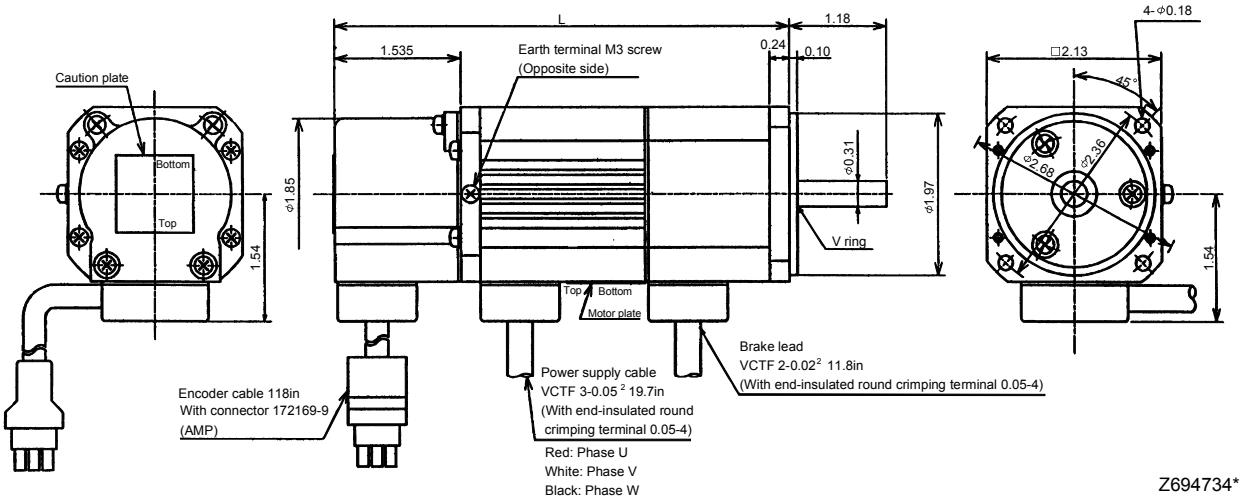


Z694733*

(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz ▪ in]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HA-FF053B	50	5.551	55	0.44	3.5
HA-FF13B	100	6.22	55	0.60	4.0

[Unit: in]

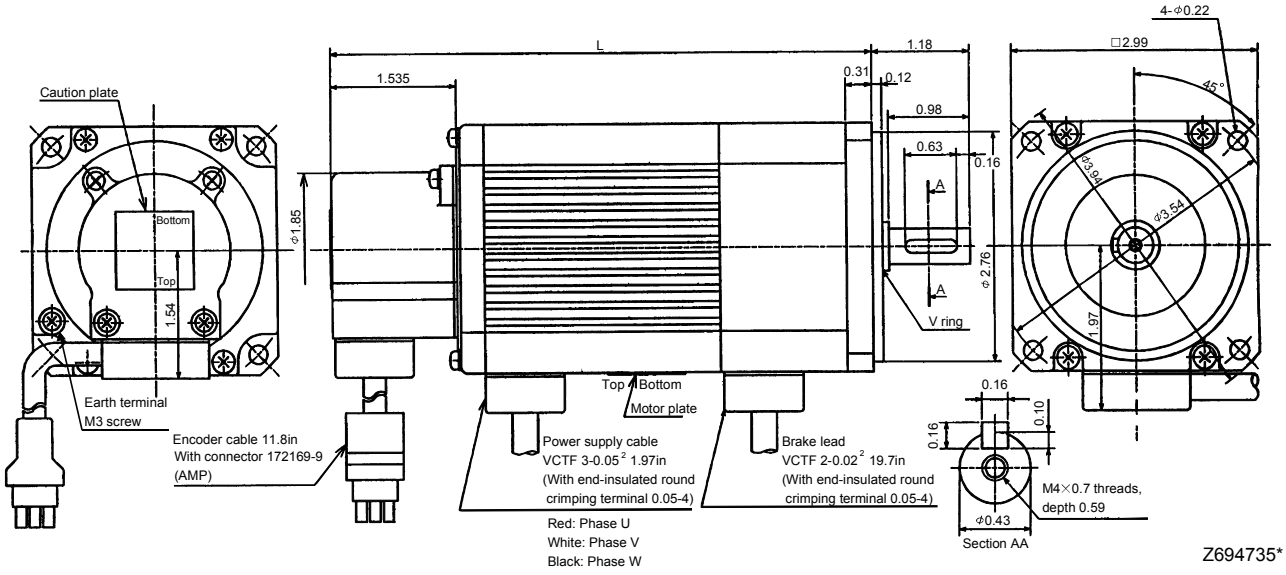


Z694734*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HA-FF23B	200	6.614	170	2.62	6.4
HA-FF33B	300	7.303	170	3.44	7.1

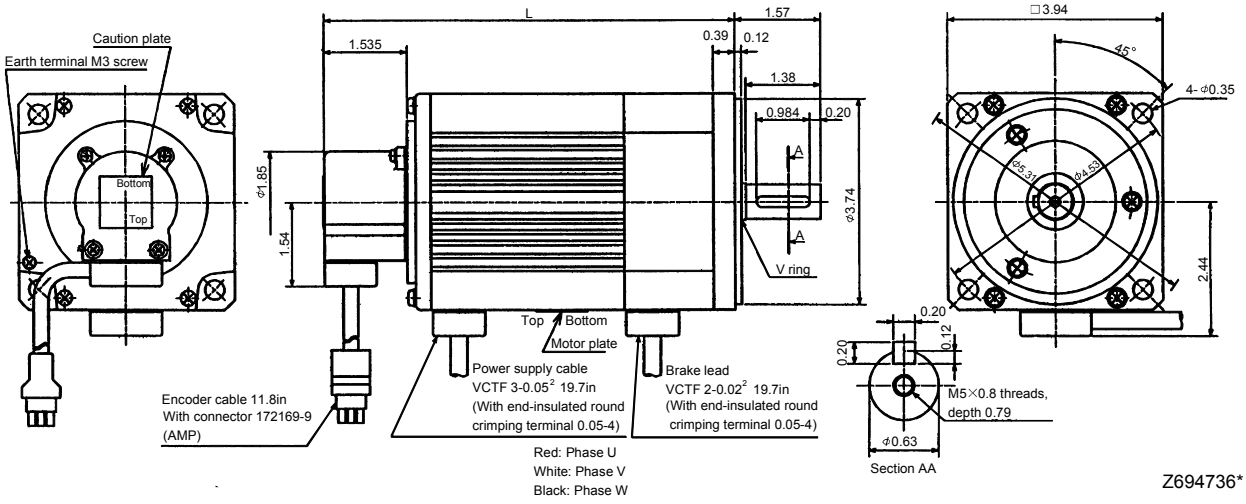
[Unit: in]



Z694735*

Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HA-FF43B	400	7.54	326	7.27	11.0
HA-FF63B	600	8.13	326	8.48	12.3

[Unit: in]



Z694736*

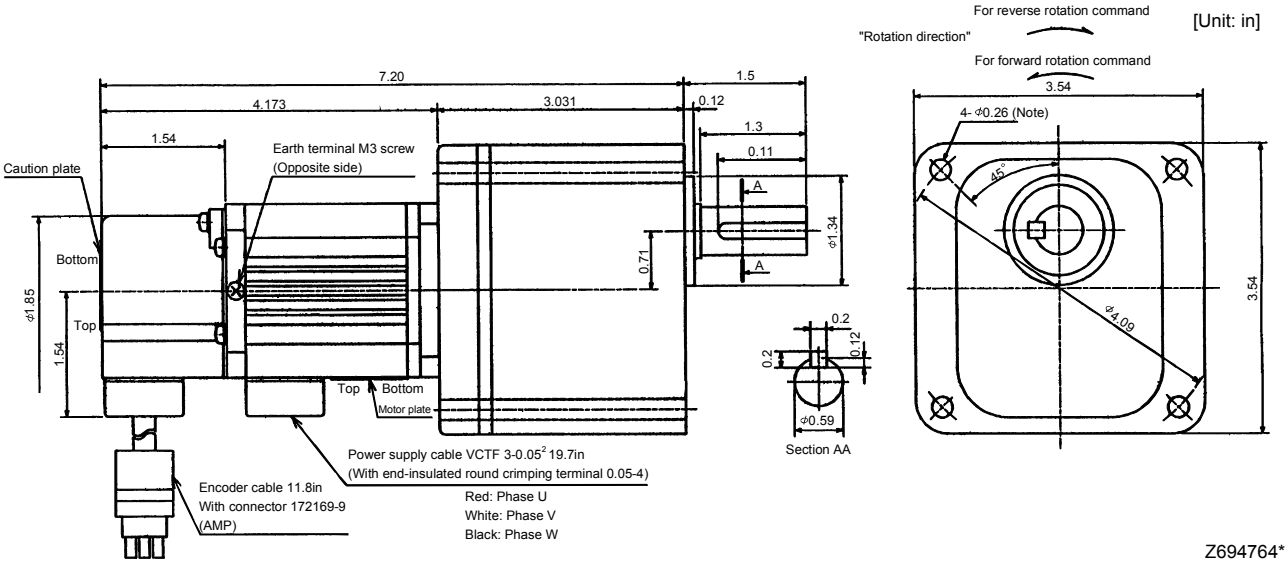
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF053G1	50	GR-S-10	1/5(9/44)	0.369	40min. to 1.5°	5.5	Same as that of motor shaft
			1/10(3/29)				
			1/20(99/1972)	0.342			Opposite to that of motor shaft
			1/30(144/4205)				

[Unit: in]

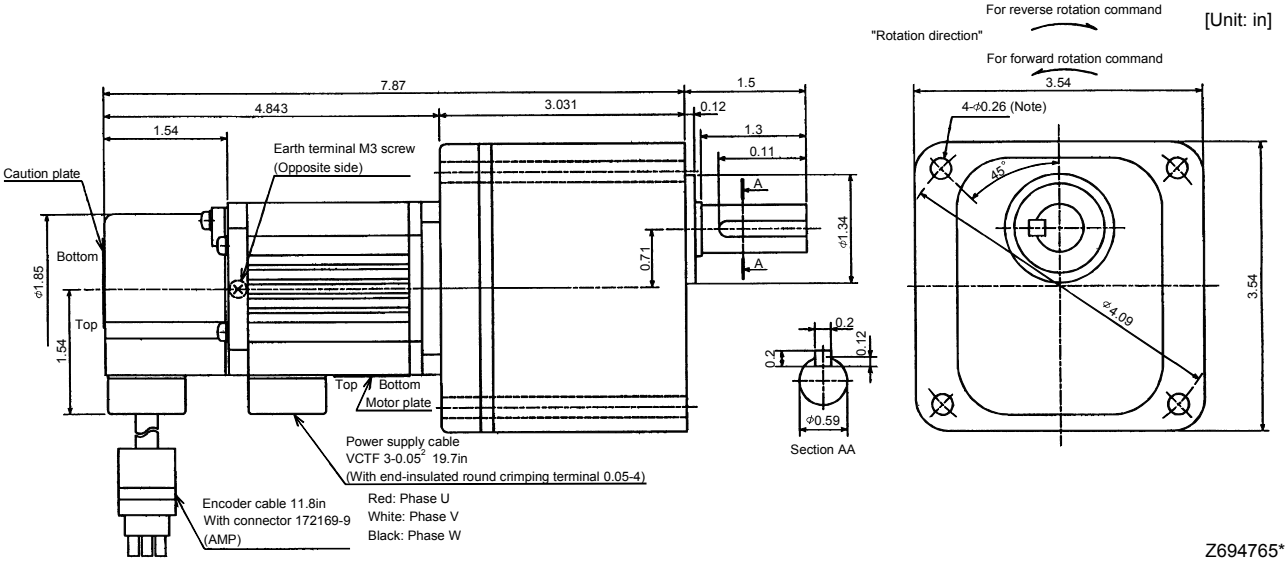


Z694764*

Note: Four M6× 90 through bolts are provided.

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF13G1	100	GR-S-10	1/5(9/44)	0.547	40min. to 1.5°	6.0	Same as that of motor shaft
			1/10(3/29)				
			1/20(99/1972)	0.519			Opposite to that of motor shaft
			1/30(144/4205)				

[Unit: in]

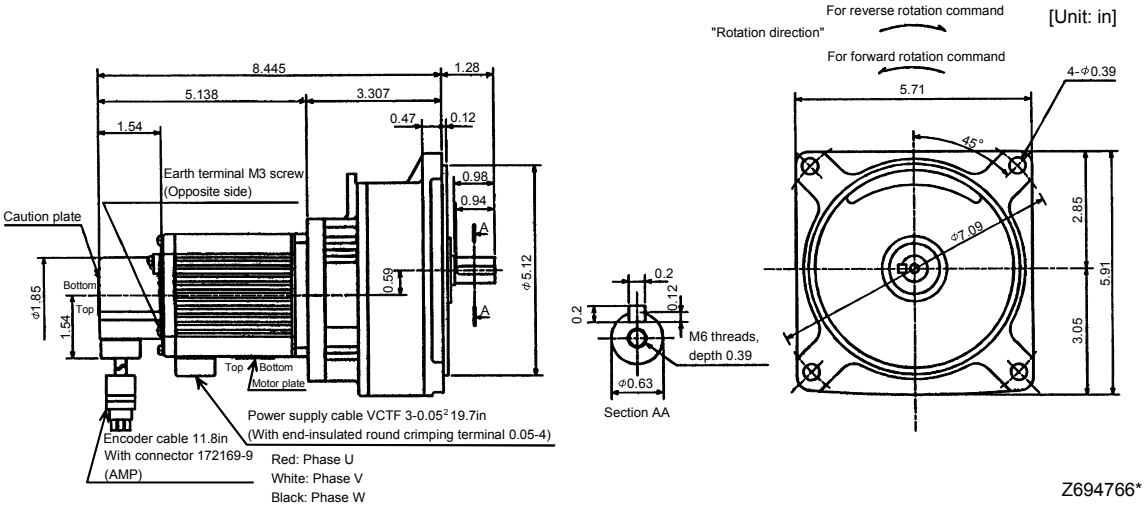


Z694765*

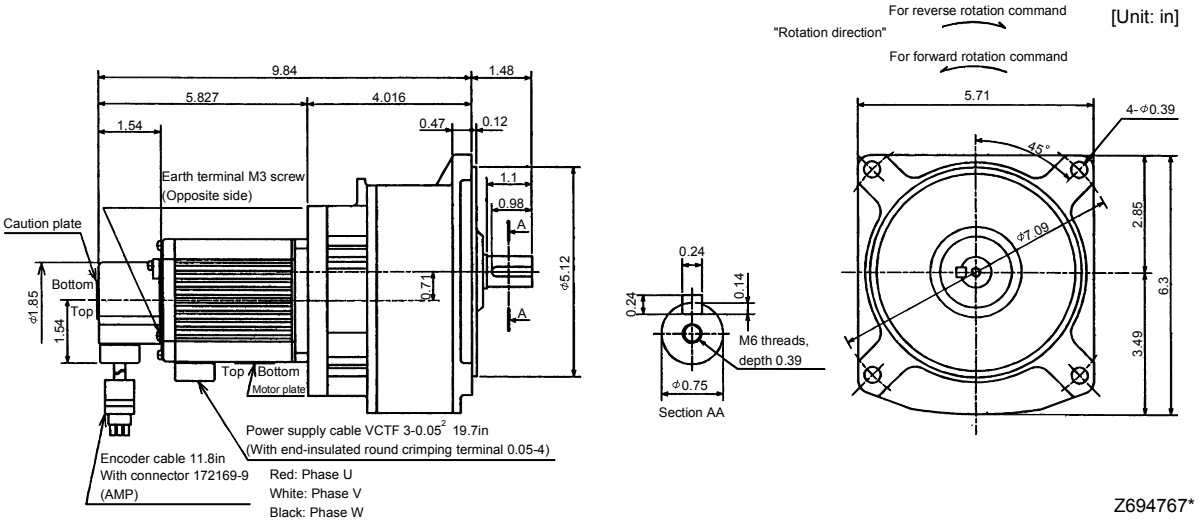
Note: Four M6× 90 through bolts are provided.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF23G1	200	GR-S-20	1/5(57/280)	2.039	40min. to 1.5°	11	Same as that of motor shaft
			1/10(39/400)				
			1/20(51/980)	2.023			
			1/30(1/30)				

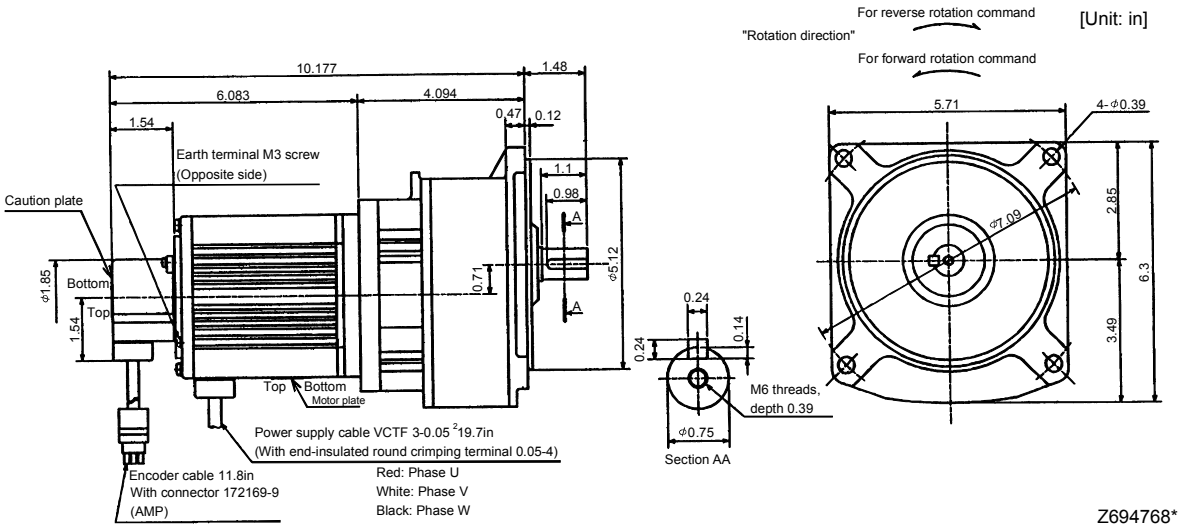


Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF33G1	300	GR-S-30	1/5(19/94)	2.980	40min. to 1.5°	14.3	Same as that of motor shaft
			1/10(39/376)				
			1/20(72/1363)	2.939			
			1/30(11/329)				

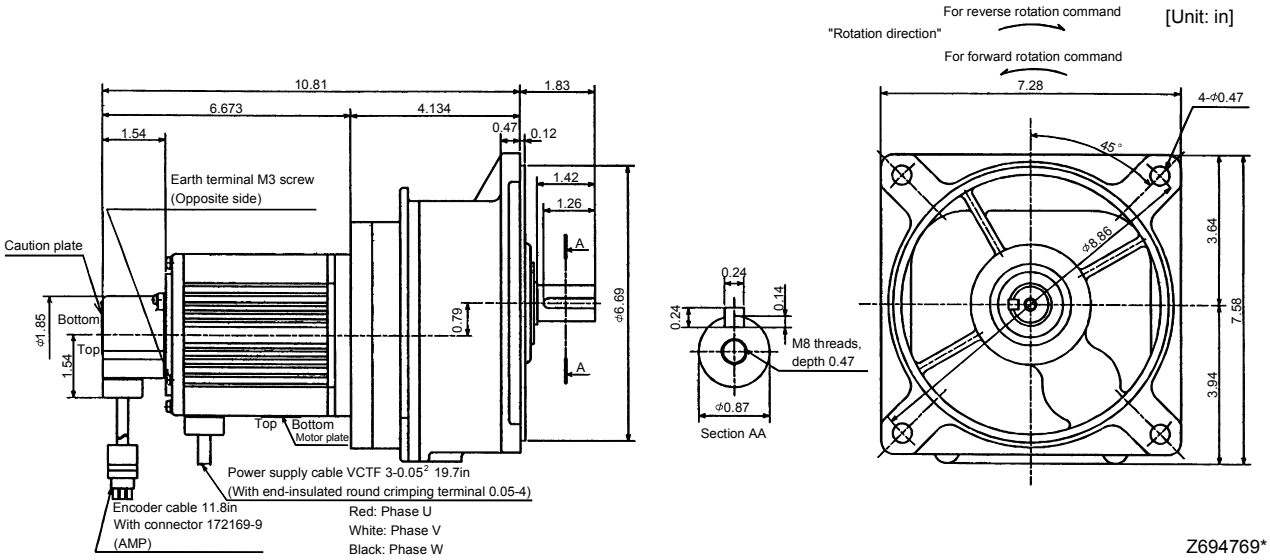


7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF43G1	400	GR-S-40	1/5(19/94)	5.577	40min. to 1.5°	17.6	Same as that of motor shaft
			1/10(39/376)				
			1/20(72/1363)	5.536			
			1/30(11/329)				

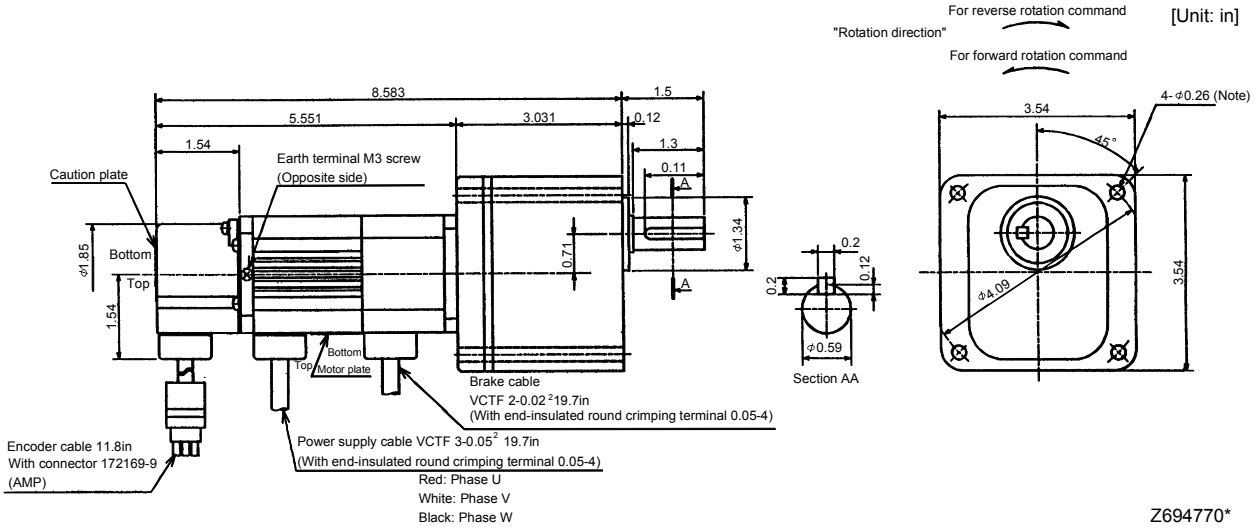


Model	Output [W]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF63G1	600	GR-S-60	1/5(10/49)	7.326	40min. to 1.5°	28.7	Same as that of motor shaft
			1/10(243/2401)				
			1/20(153/2891)	7.217			
			1/30(27/784)				



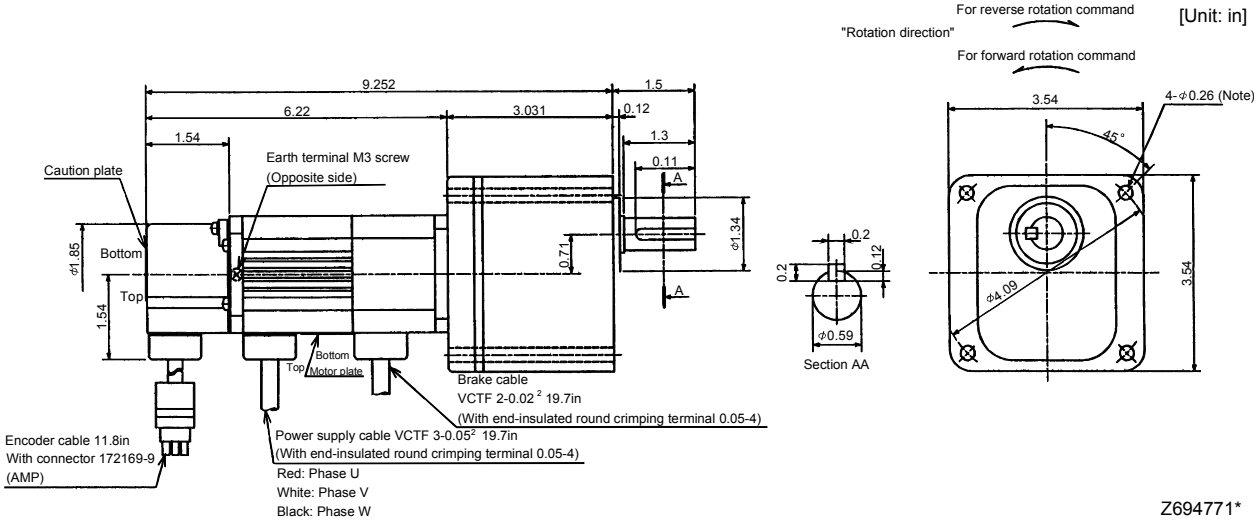
(b) With electromagnetic brake

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF053BG1	50	55	GR-S-10	1/5(9/44)	0.465	40min. to 1.5°	6.2	Same as that of motor shaft
				1/10(3/29)				
				1/20(99/1972)	0.437			Opposite to that of motor shaft
				1/30(144/4205)				



Note: Four M6×90 through bolts are provided.

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF13BG1	100	55	GR-S-10	1/5(9/44)	0.629	40min. to 1.5°	6.6	Same as that of motor shaft
				1/10(3/29)				
				1/20(99/1972)	0.601			Opposite to that of motor shaft
				1/30(144/4205)				

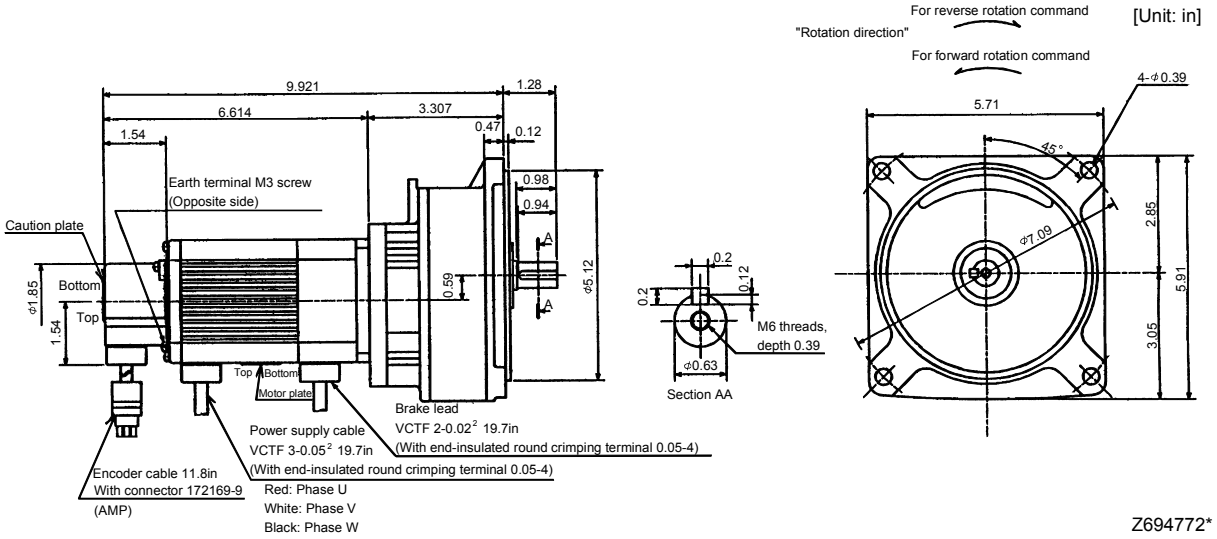


Note: Four M6×90 through bolts are provided.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF23BG1	200	170	GR-S-20	1/5(57/280)	2.75	40min. to 1.5°	12.3	Same as that of motor shaft
				1/10(39/400)				
				1/20(51/980)	2.734			
				1/30(1/30)				

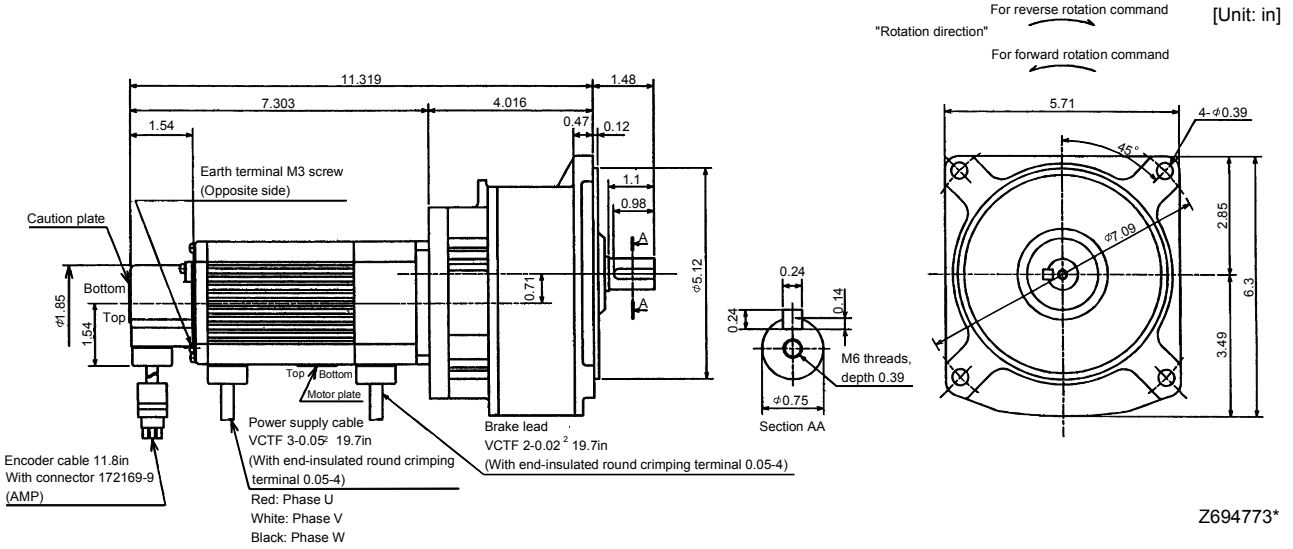
[Unit: in]



Z694772*

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF33BG1	300	170	GR-S-30	1/5(19/94)	3.707	40min. to 1.5°	15.9	Same as that of motor shaft
				1/10(39/376)				
				1/20(72/1363)	3.663			
				1/30(11/329)				

[Unit: in]

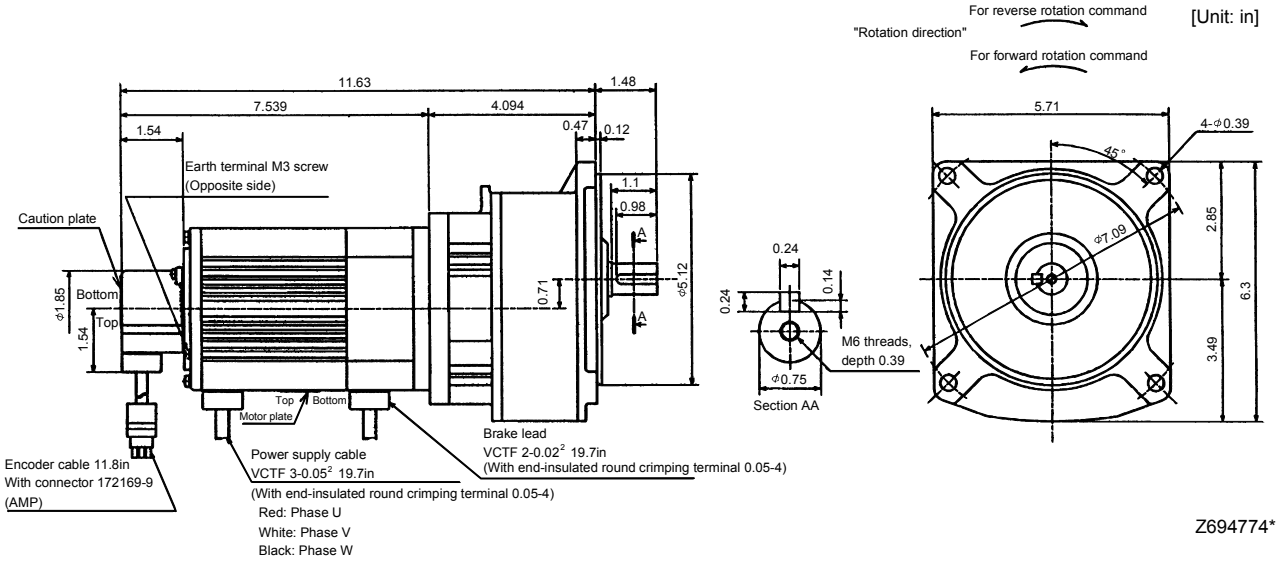


Z694773*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF43BG1	400	326	GR-S-40	1/5(19/94)	7.490	40min. to 1.5°	19.6	Same as that of motor shaft
				1/10(39/376)				
				1/20(72/1363)	7.449			
				1/30(11/329)				

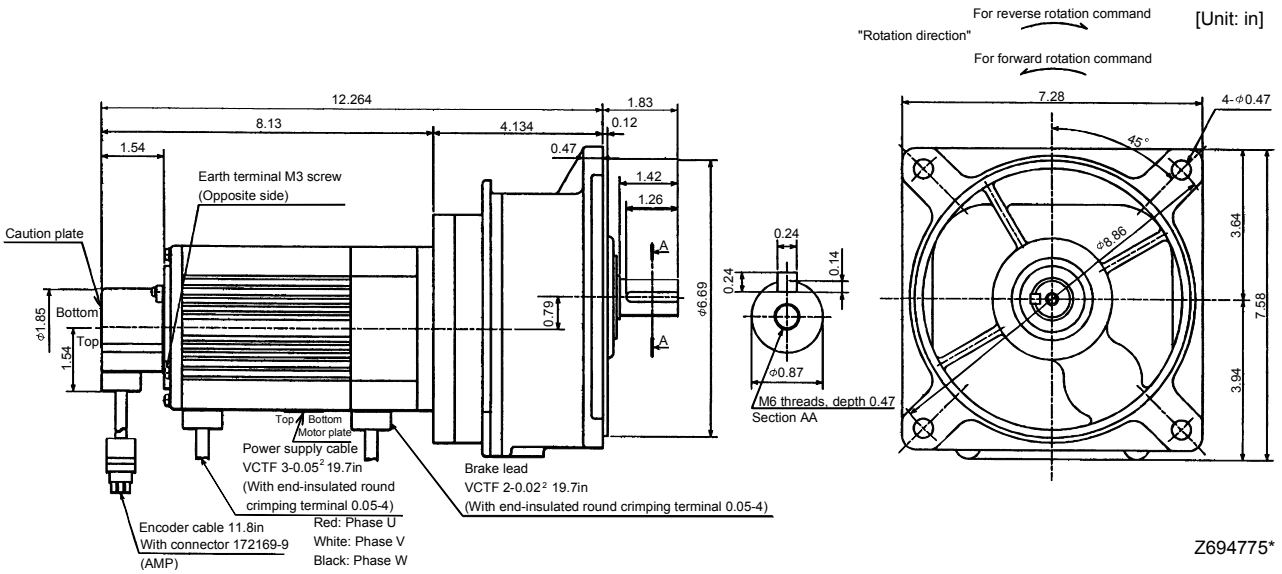
[Unit: in]



Z694774*

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]	Output Shaft Rotation Direction
HA-FF63BG1	600	326	GR-S-60	1/5(10/49)	9.240	40min. to 1.5°	30.6	Same as that of motor shaft
				1/10(243/2401)				
				1/20(153/2891)	9.131			
				1/30(27/784)				

[Unit: in]



Z694775*

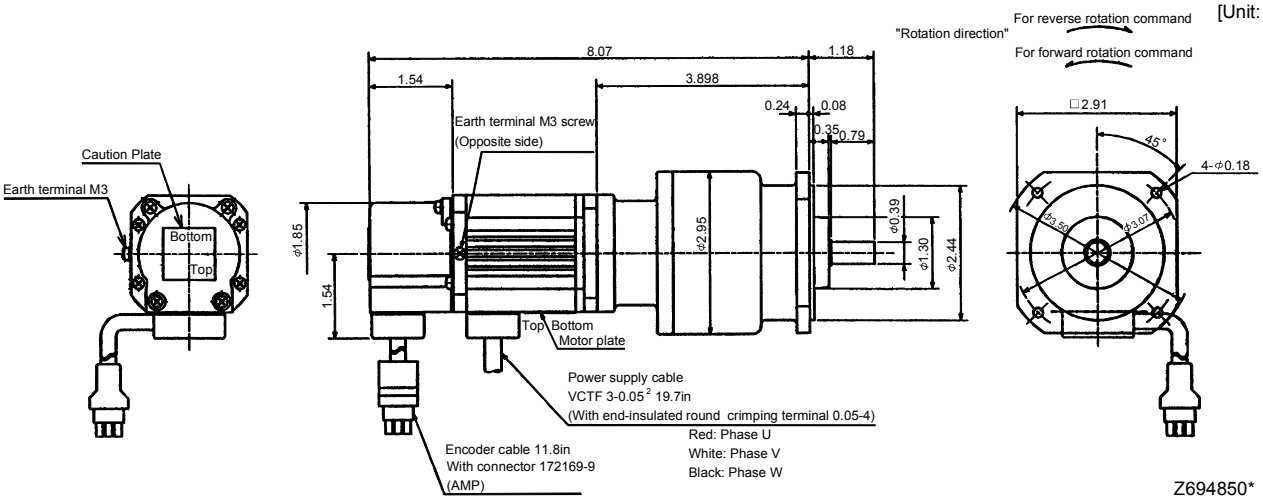
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HA-FF053G2	50	BM2-05B-A5MES	1/5	0.60	3 min. max.	5.1

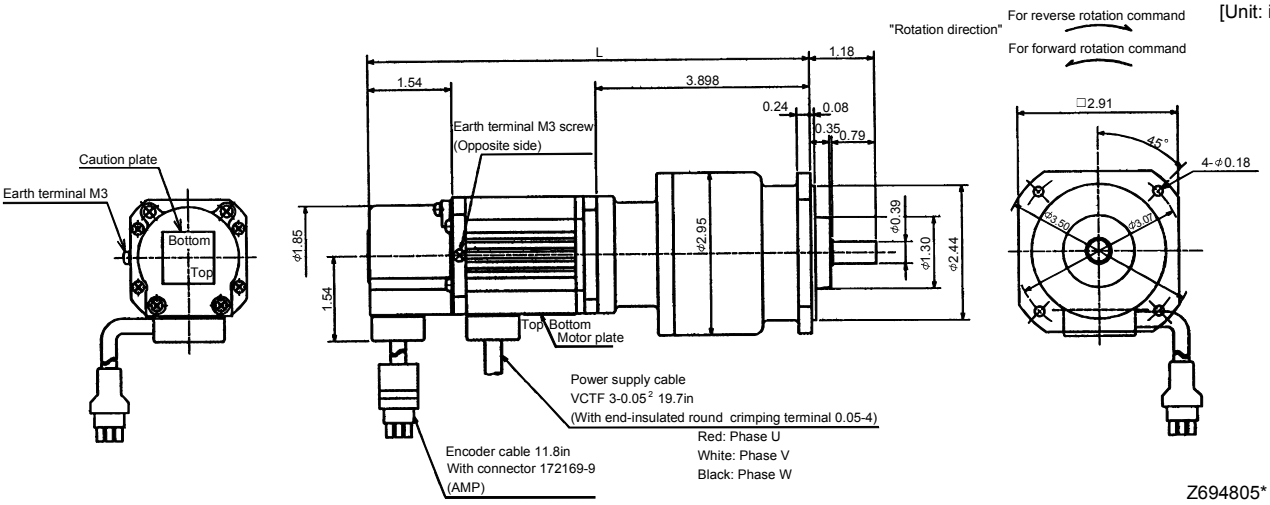
[Unit: in]



Z694850*

Model	Output [W]	Variable Dimensions [in] L	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HA-FF053G2	50	8.07	BM2-10B-A5MES	1/10	0.59	3 min. max.	5.1
HA-FF053G2	50	8.07	BM2-15B-A5MES	1/15	0.57	3 min. max.	5.1
HA-FF13G2	100	8.74	BM2-05B-01MES	1/5	0.78	3 min. max.	5.5

[Unit: in]

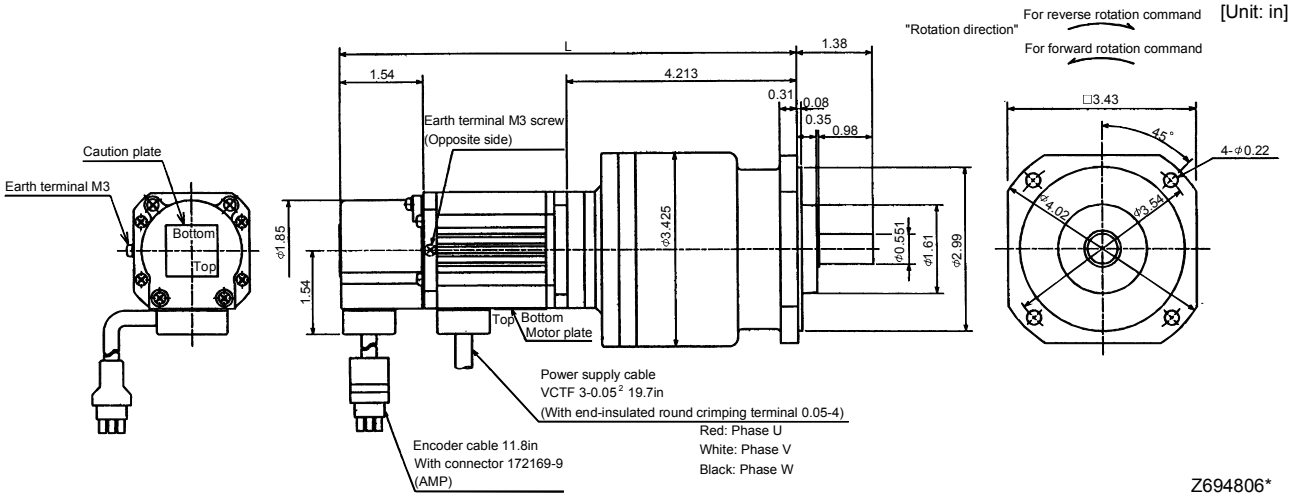


Z694805*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HA-FF053G2	50	8.39	BM3-25B-A5MES	1/25	0.601	3min. max.	6.2
HA-FF13G2	100	9.06	BM3-10B-01MES	1/10	0.90	3min. max.	6.6
HA-FF13G2	100	9.06	BM3-15B-01MES	1/15	0.85	3min. max.	6.6

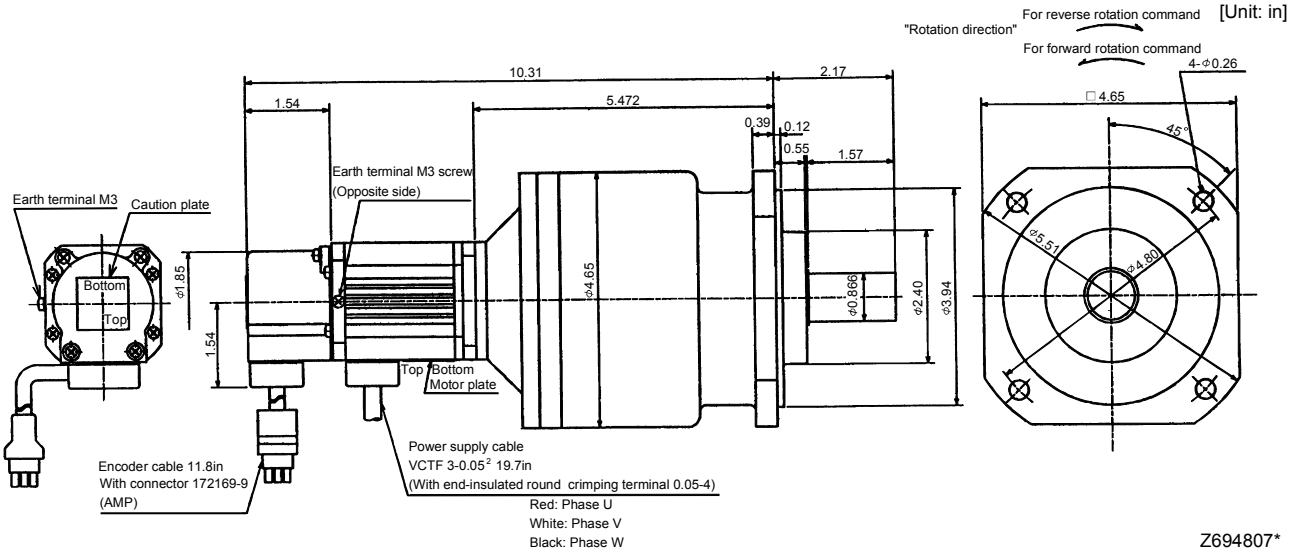
[Unit: in]



Z694806*

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HA-FF13G2	100	BM4-25B-01MES	1/25	1.59	3min. max.	11.0

[Unit: in]

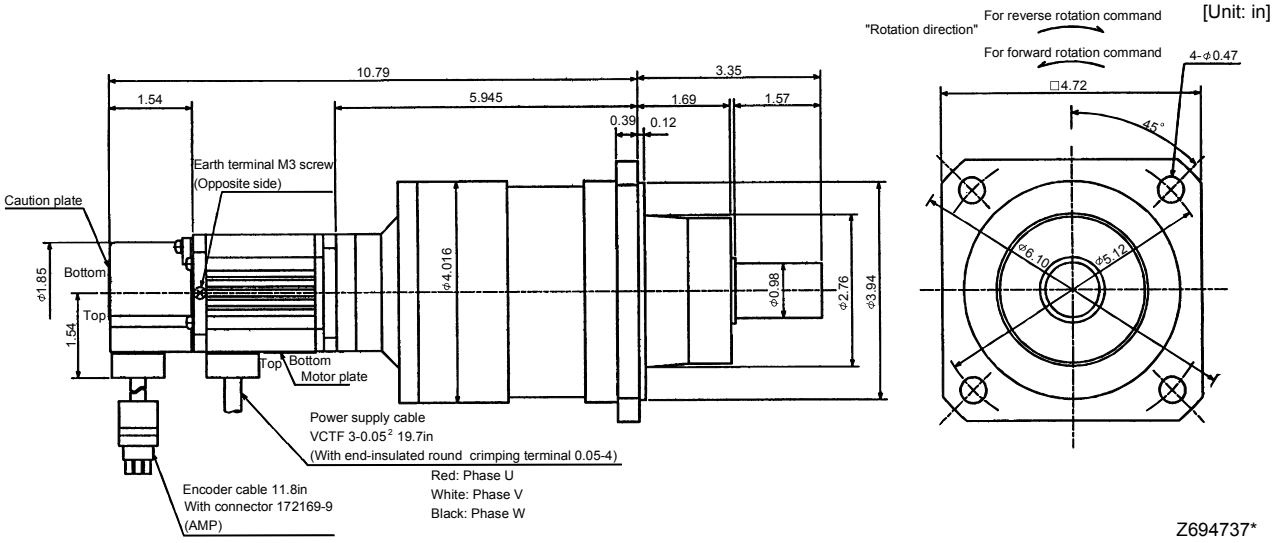


Z694807*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HA-FF13G2	100	BL1-45B-01MES	1/45	1.60	3min. max.	13.2

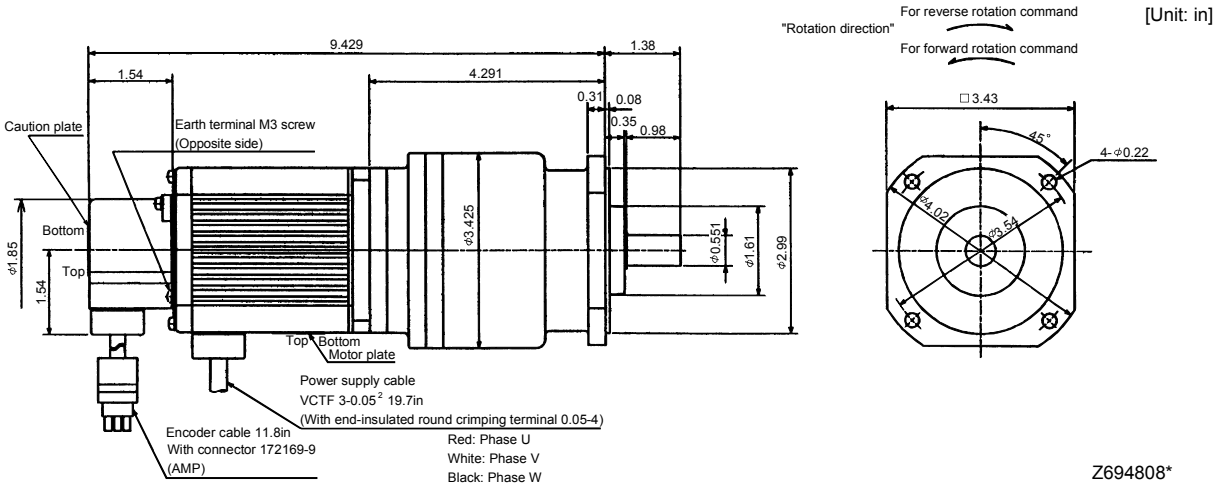
[Unit: in]



Z694737*

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HA-FF23G2	200	BM3-05B-02MES	1/5	2.32	3min. max.	8.4

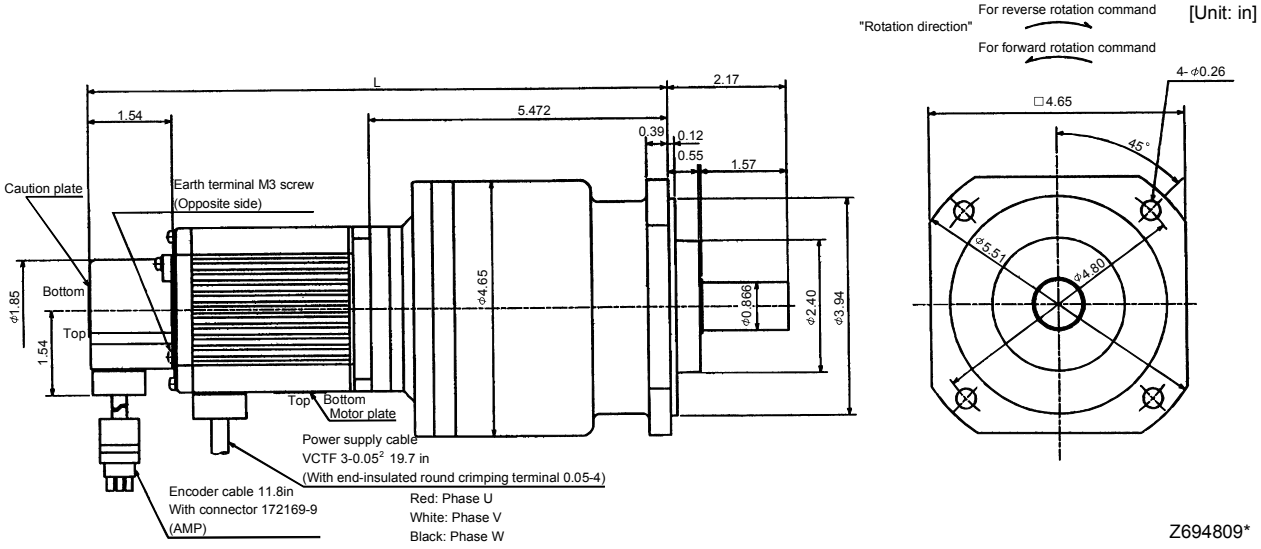
[Unit: in]



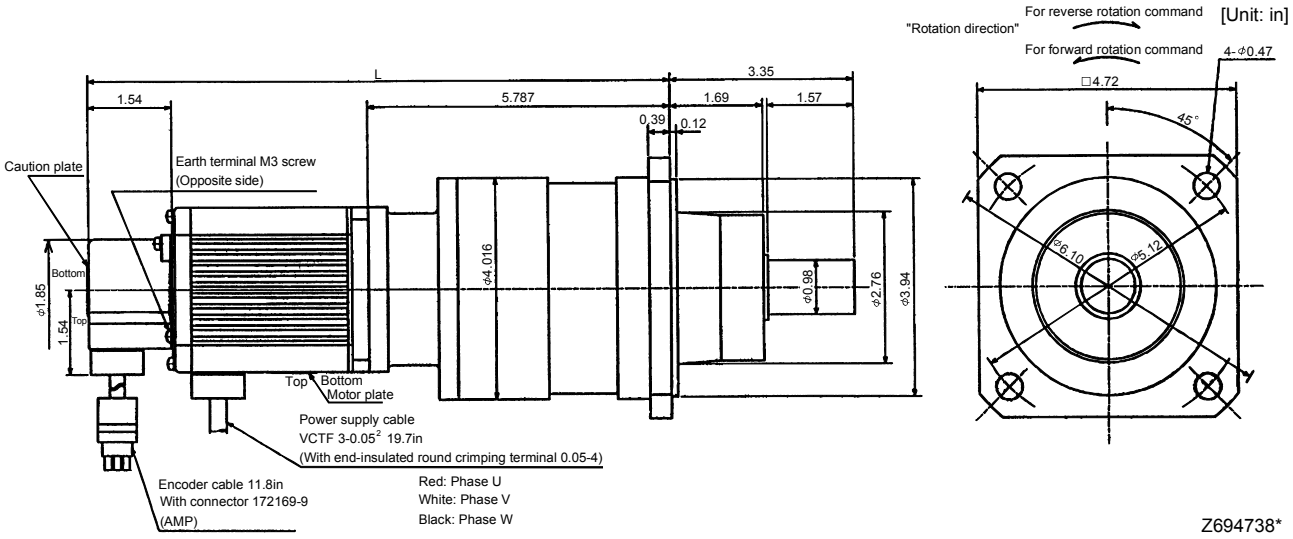
Z694808*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF23G2	200	10.61	BM4-10B-02MES	1/10	3.53	3min. max.	12.8
HA-FF23G2	200	10.61	BM4-15B-02MES	1/15	3.38	3min. max.	12.8
HA-FF33G2	300	11.30	BM4-10B-03MES	1/10	4.35	3min. max.	13.4



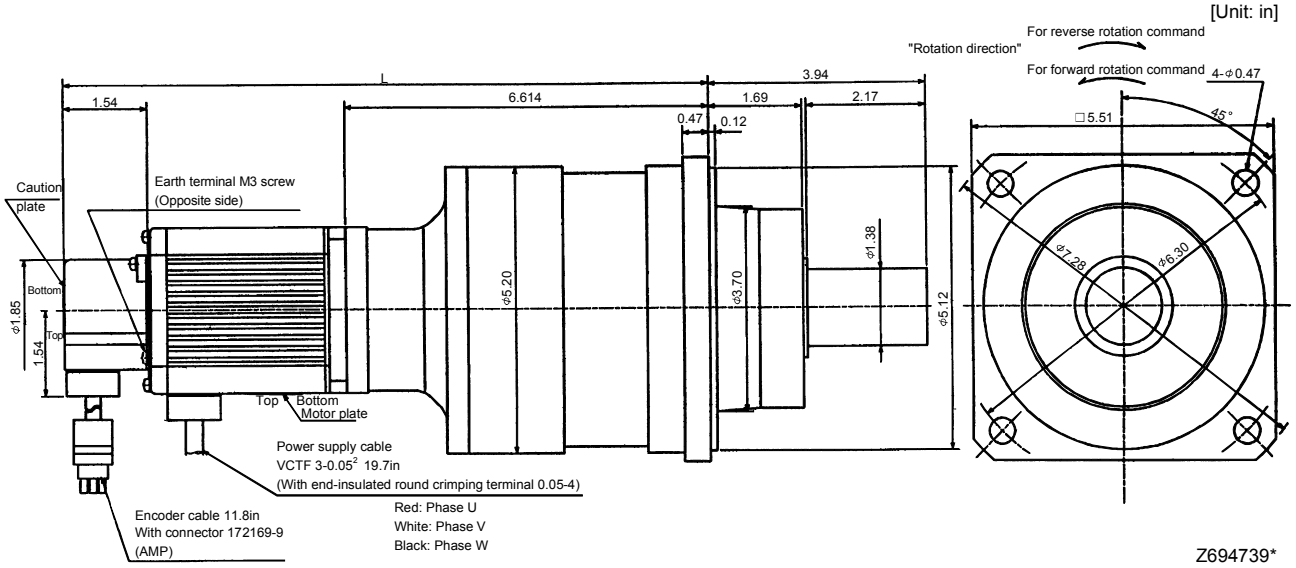
Model	Output [W]	Variable Dimensions [in] L	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF23G2	200	10.94	BL1-20B-02MES	1/20	3.99	3min. max.	15.0
HA-FF23G2	200	10.94	BL1-29B-02MES	1/29	3.46	3min. max.	15.0
HA-FF33G2	300	11.61	BL1-20B-03MES	1/20	4.81	3min. max.	15.7



7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF23G2	200	11.77	BL2-45B-02MES	1/45	4.17	3min. max.	27.1
HA-FF33G2	300	12.44	BL2-29B-03MES	1/29	83.9	3min. max.	27.8
HA-FF33G2	300	12.44	BL2-45B-03MES	1/45	4.99	3min. max.	27.8

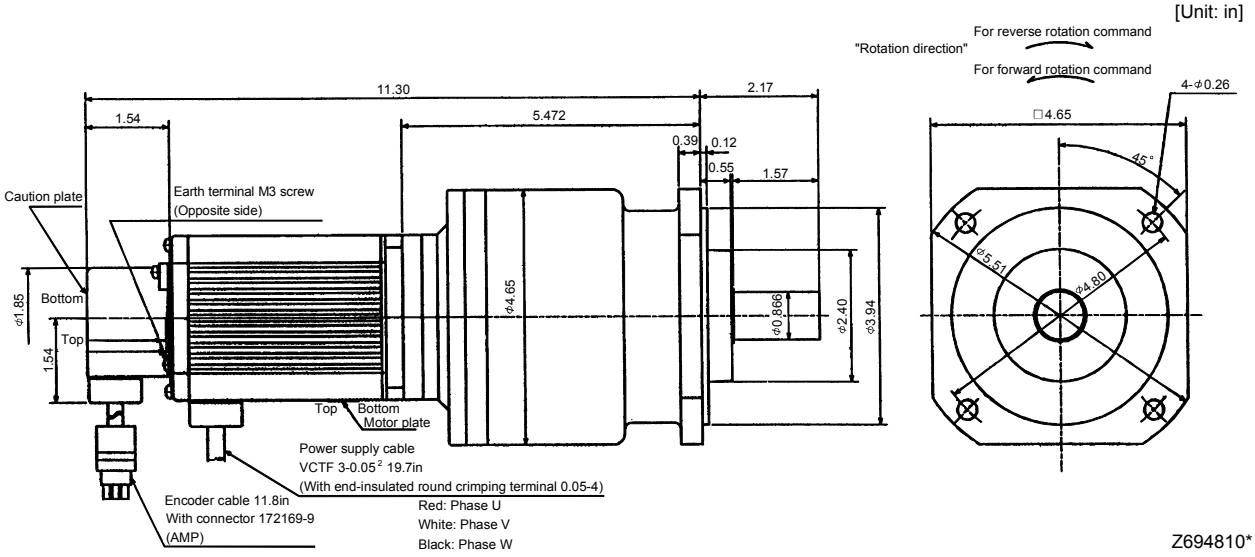
[Unit: in]



Z694739*

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF33G2	300	BM4-05B-03MES	1/5	4.47	3min. max.	13.4

[Unit: in]

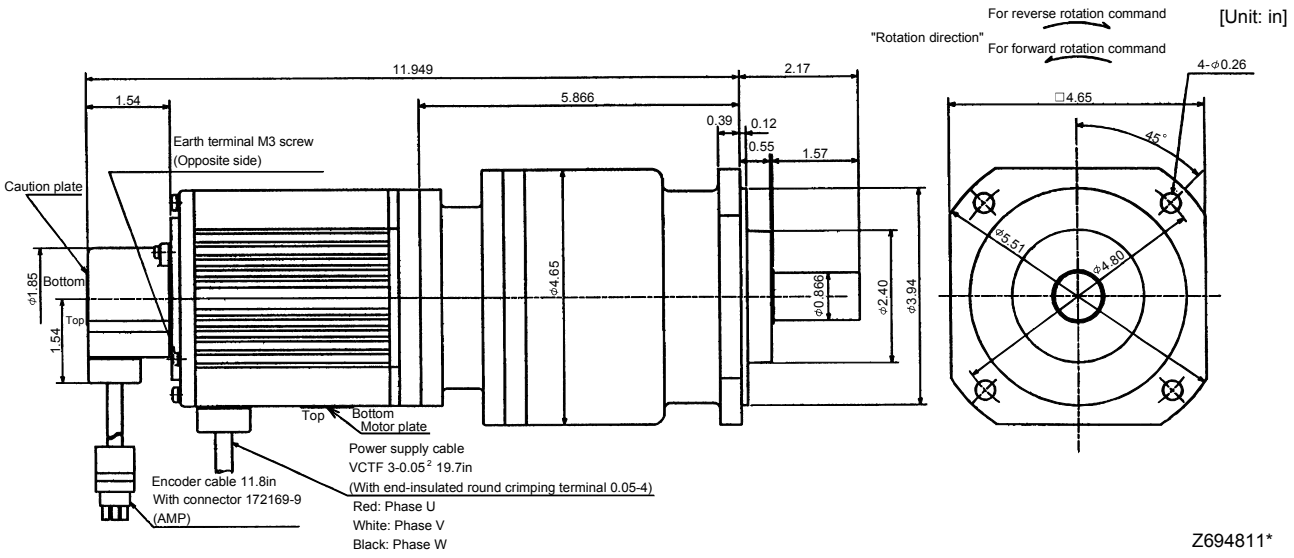


Z694810*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HA-FF43G2	400	BM4-05B-04MES	1/5	7.07	3min. max.	17.0

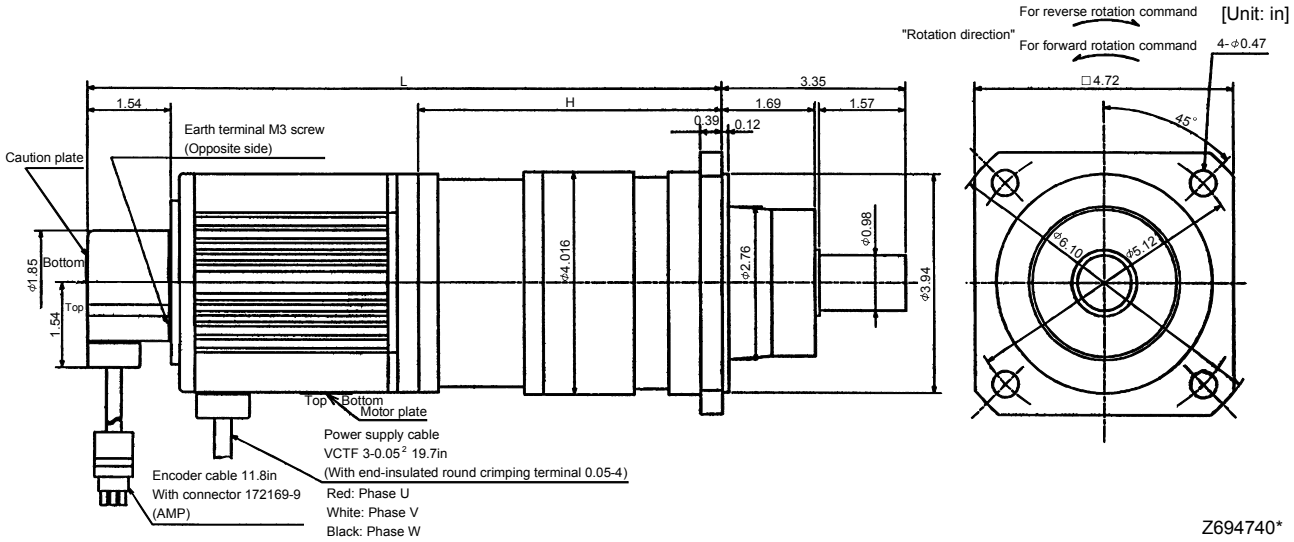
[Unit: in]



Z694811*

Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
		L	H					
HA-FF43G2	400	11.63	5.557	BL1-09B-04MES	1/9	6.52	3min. max.	18.1
HA-FF63G2	600	11.83	5.157	BL1-05B-06MES	1/5	7.01	3min. max.	19.4
HA-FF63G2	600	12.22	5.557	BL1-09B-06MES	1/9	7.75	3min. max.	19.4

[Unit: in]

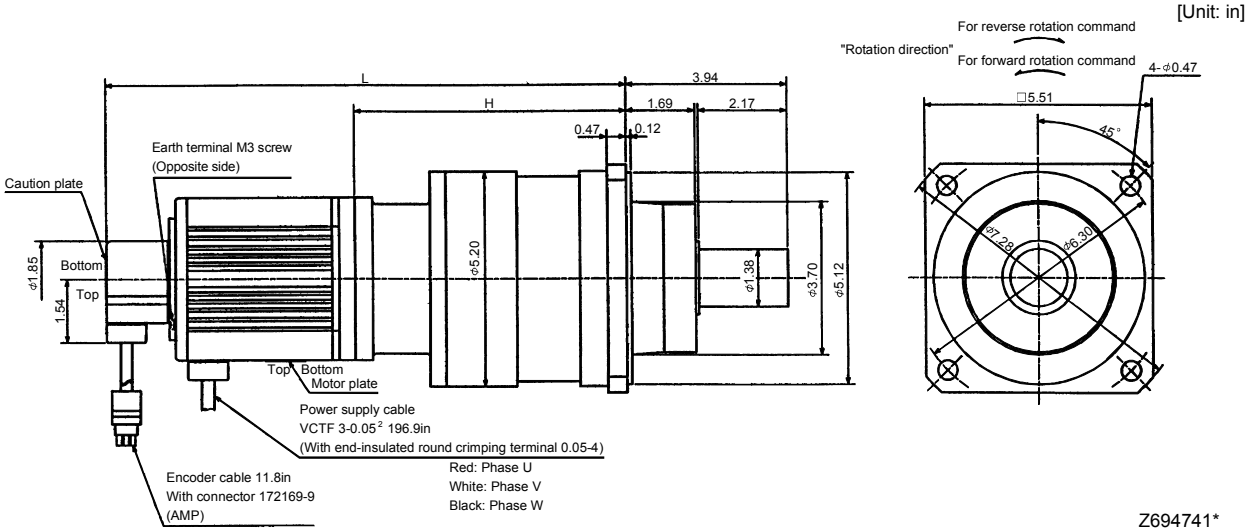


Z694740*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] H	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HA-FF43G2	400	12.74	6.654	BL2-20B-04MES	1/20	13.00	3min. max	31.3
HA-FF43G2	400	12.74	6.654	BL2-29B-04MES	1/29	10.99	3min. max	31.3
HA-FF43G2	400	13.13	7.047	BL2-45B-04MES	1/45	7.59	3min. max	31.3
HA-FF63G2	600	13.33	6.654	BL2-20B-06MES	1/20	14.23	3min. max	32.6
HA-FF63G2	600	13.33	6.654	BL2-29B-06MES	1/29	12.22	3min. max	32.6

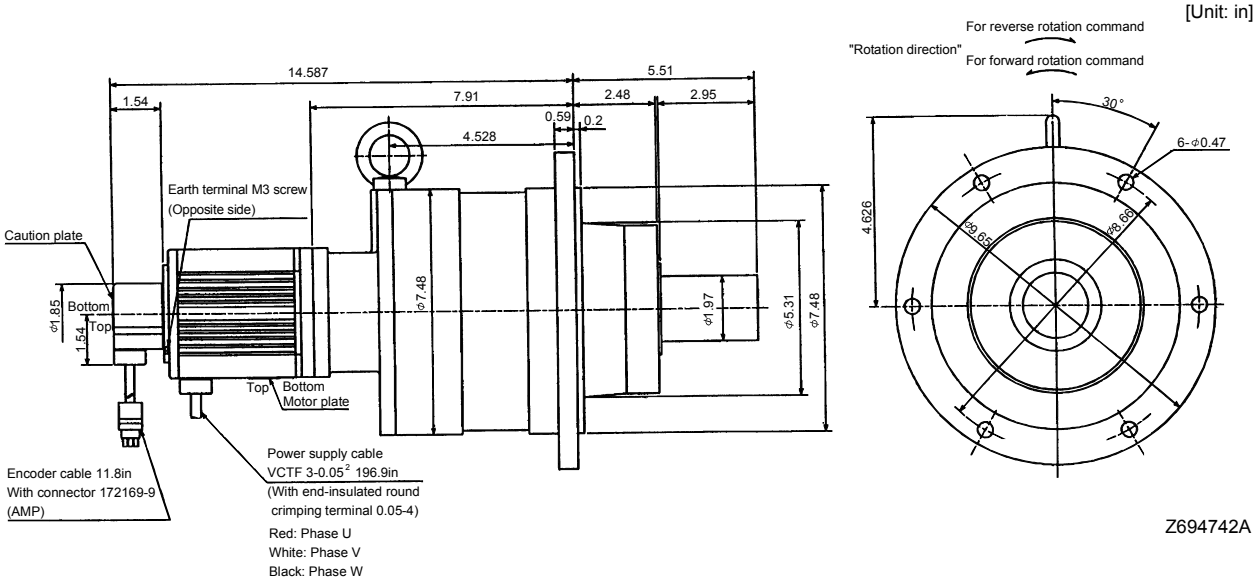
[Unit: in]



Z694741*

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Backlash	Mass [lb]
HA-FF63G2	600	BL3-45B-06MES	1/45	17.11	3min. max.	65.7

[Unit: in]

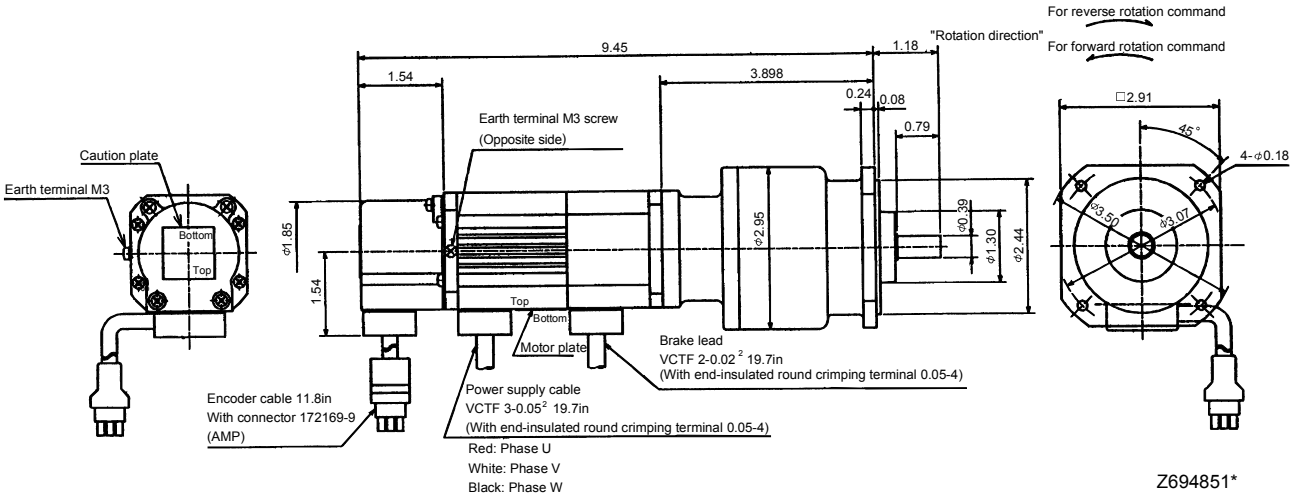


Z694742A

(b) With electromagnetic brake

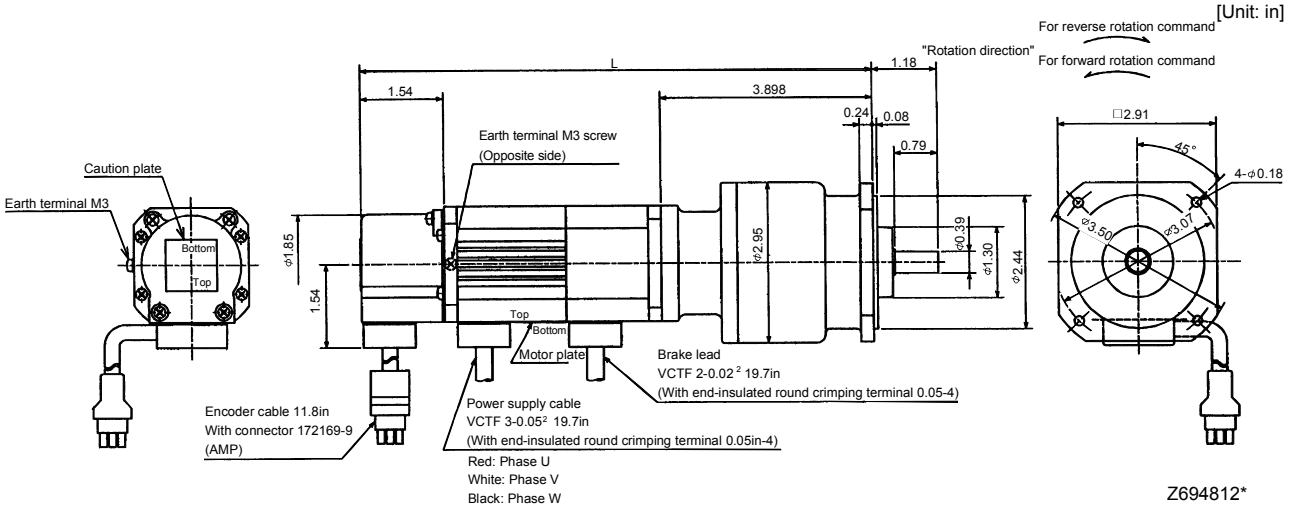
Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF053BG2	50	55	BM2-05B-A5MES	1/5	0.70	3min. max.	5.7

[Unit: in]



Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF053BG2	50	9.45	55	BM2-05B-A5MES	1/10	0.68	3 min. max.	5.7
HA-FF053BG2	50	9.45	55	BM2-15B-A5MES	1/15	0.67	3 min. max.	5.7
HA-FF13BG2	100	10.118	55	BM2-05B-01MES	1/5	0.87	3 min. max.	6.2

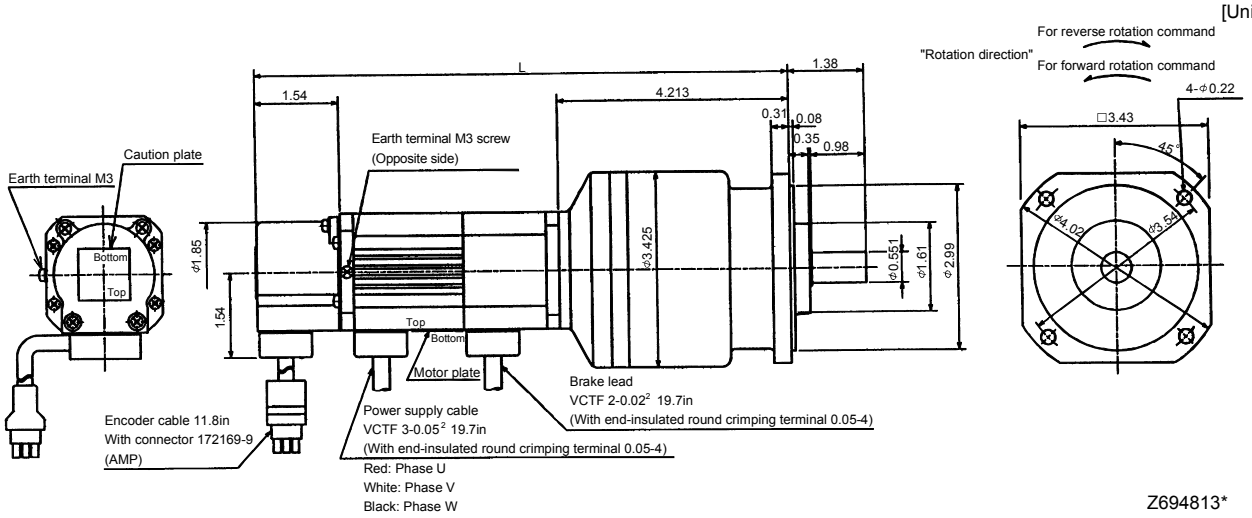
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF053BG2	50	9.764	55	BM3-25B-A5MES	1/25	0.66	3 min. max.	7.1
HA-FF13BG2	100	10.433	55	BM3-10B-01MES	1/10	1.00	3 min. max.	7.5
HA-FF13BG2	100	10.433	55	BM3-15B-01MES	1/15	0.95	3 min. max.	7.5

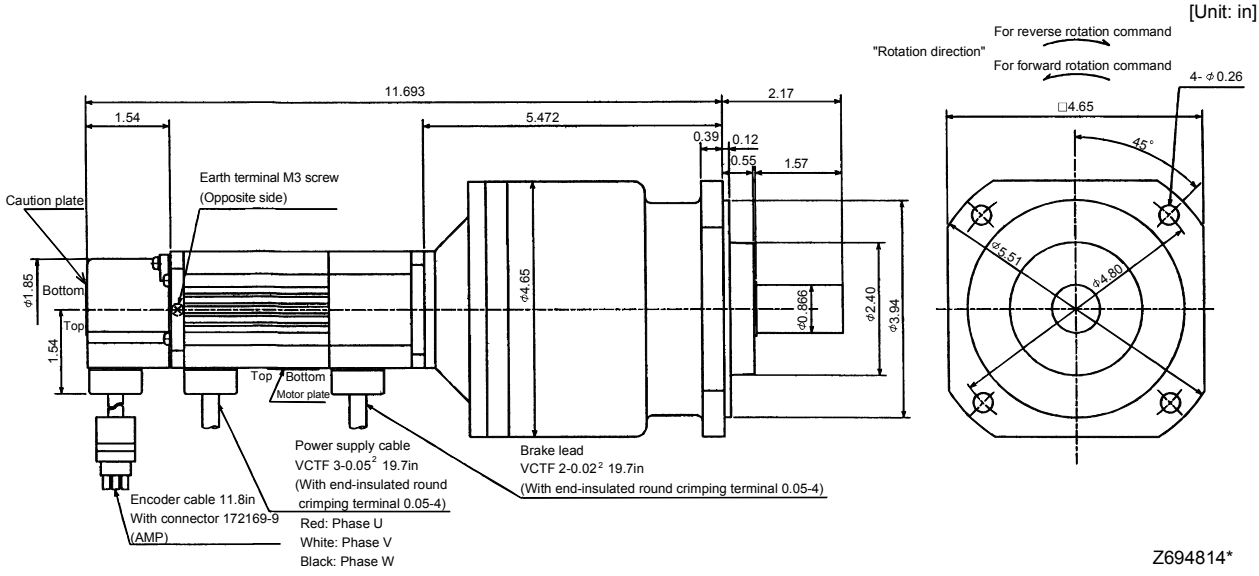
[Unit: in]



Z694813*

Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF13BG2	100	55	BM4-25B-01MES	1/25	1.68	3 min. max.	11.7

[Unit: in]

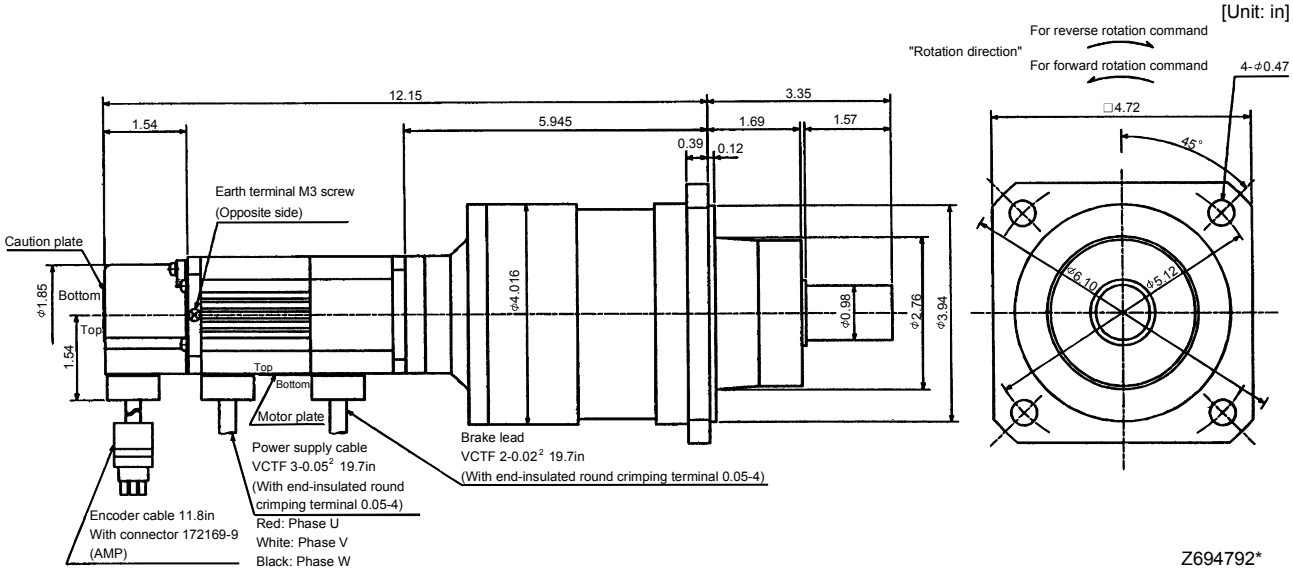


Z694814*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HA-FF13BG2	100	55	BL1-45B-01MES	1/45	1.63	3 min. max.	13.9

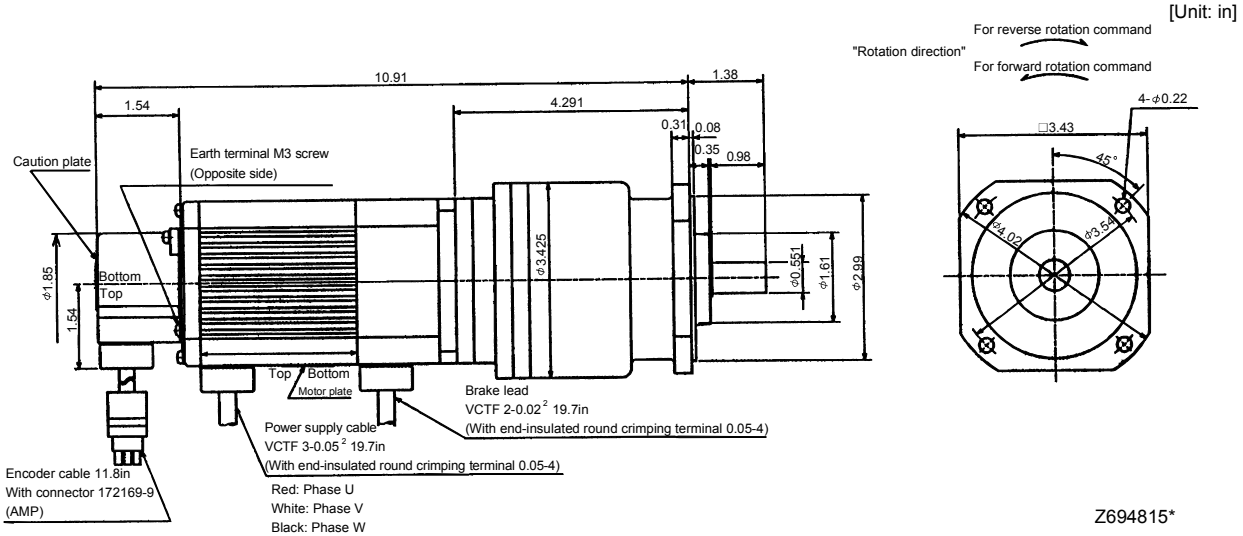
[Unit: in]



Z694792*

Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HA-FF23BG2	200	170	BM3-05B-02MES	1/5	3.05	3 min. max.	9.7

[Unit: in]

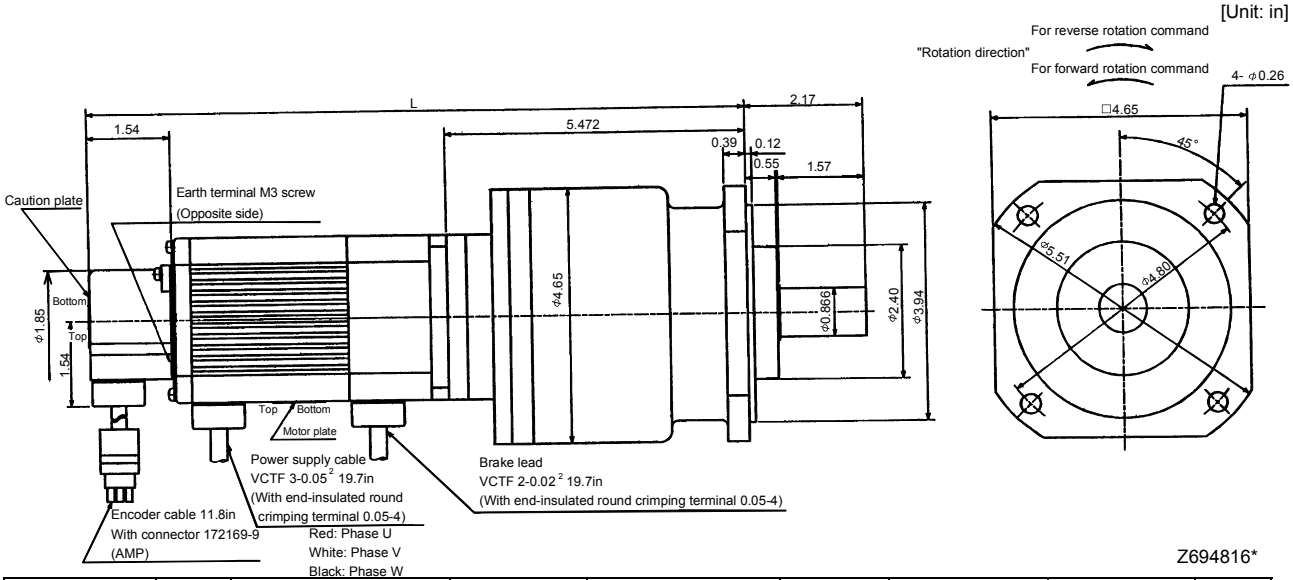


Z694815*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF23BG2	200	12.087	170	BM4-10B-02MES	1/10	4.25	3 min. max.	14.1
HA-FF23BG2	200	12.087	170	BM4-15B-02MES	1/15	4.10	3 min. max.	14.1
HA-FF33BG2	300	12.78	170	BM4-10B-03MES	1/10	5.07	3 min. max.	14.8

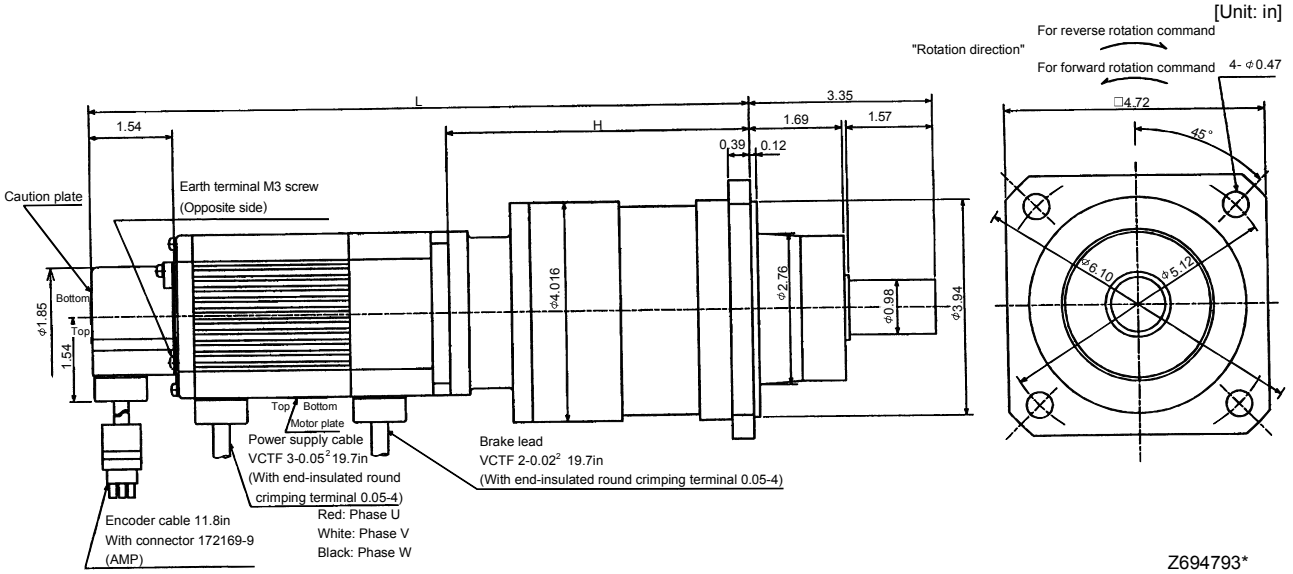
[Unit: in]



Z694816*

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] H	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF23BG2	200	12.26	5.669	170	BL1-20B-02MES	1/20	4.84	3 min. max.	16.3
HA-FF23BG2	200	12.38	5.787	170	BL1-29B-02MES	1/29	4.18	3 min. max.	16.3
HA-FF33BG2	300	12.97	5.669	170	BL1-20B-03MES	1/20	5.54	3 min. max.	17.0

[Unit: in]

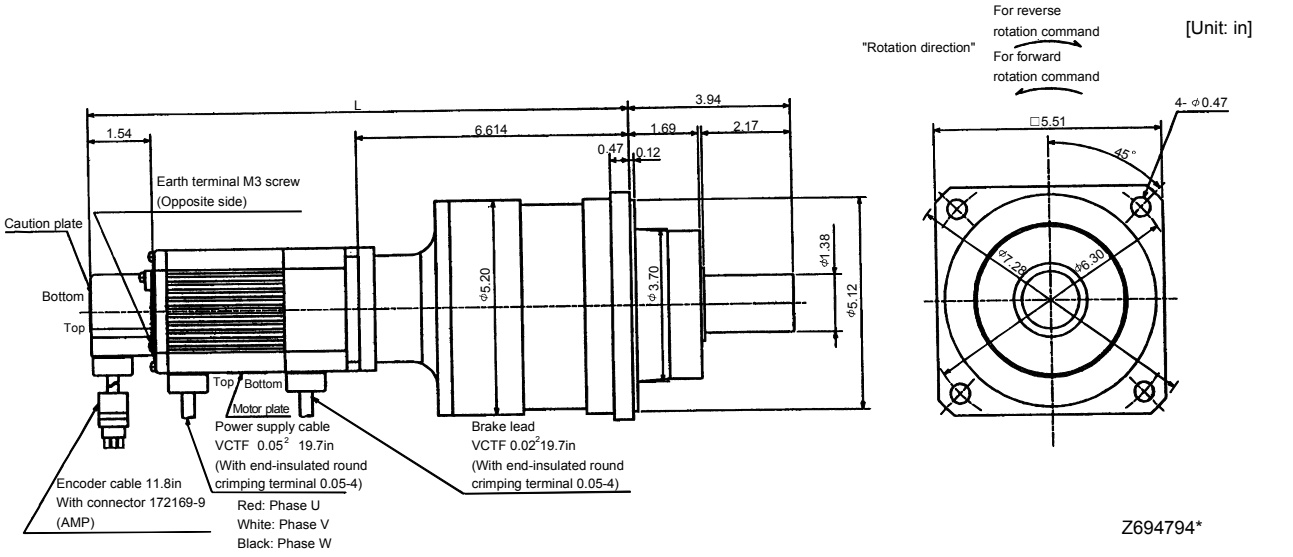


Z694793*

7. OUTLINE DIMENSION DRAWINGS

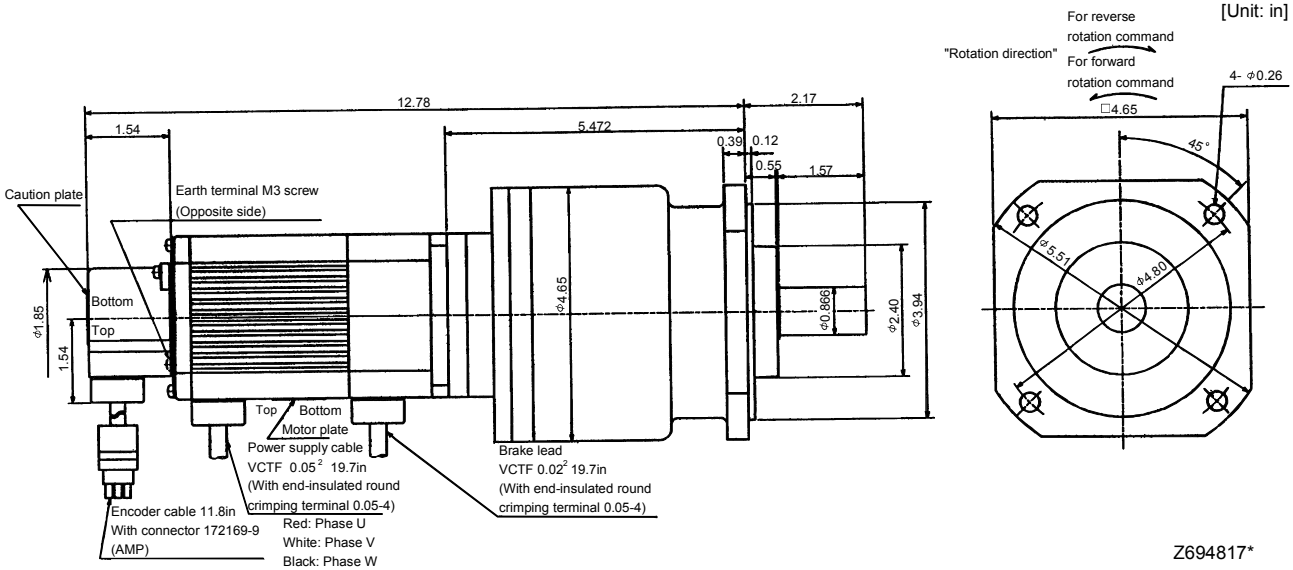
Model	Output [W]	Variable Dimensions [in] L	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HA-FF23BG2	200	13.23	170	BL2-45B-02MES	1/45	4.89	3 min. max.	28.4
HA-FF33BG2	300	13.92	170	BL2-29B-03MES	1/29	9.12	3 min. max.	29.1
HA-FF33BG2	300	14.31	170	BL2-45B-03MES	1/45	5.71	3 min. max.	29.1

[Unit: in]



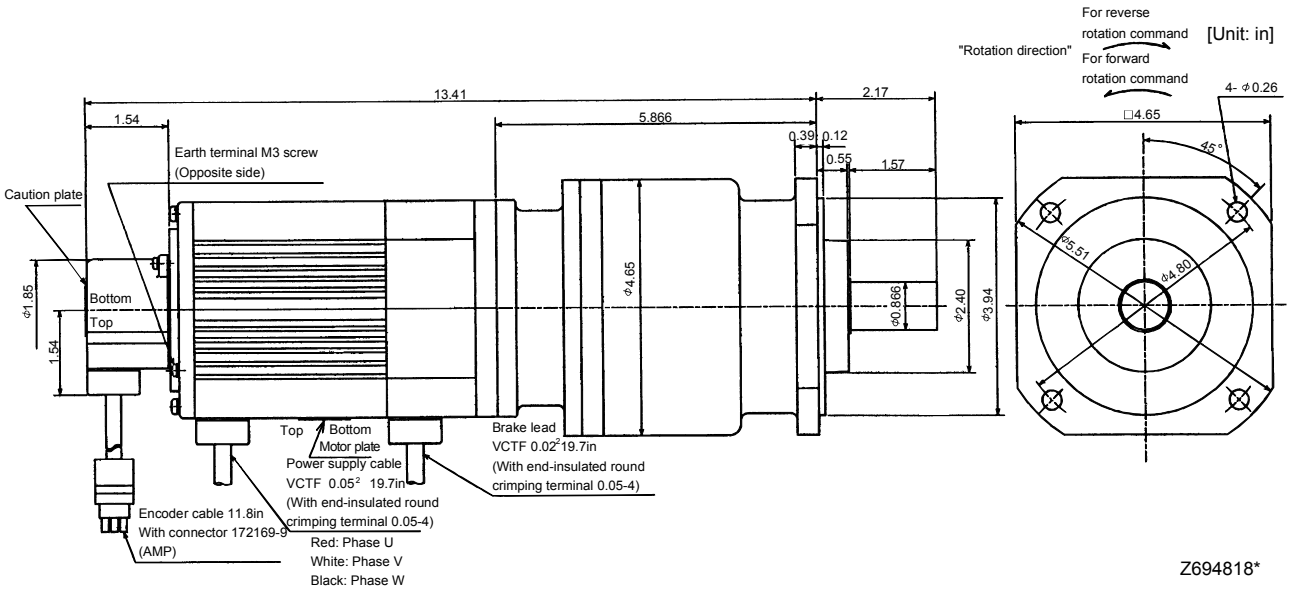
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HA-FF33BG2	300	170	BM4-05B-03MES	1/5	5.19	3 min. max.	14.8

[Unit: in]



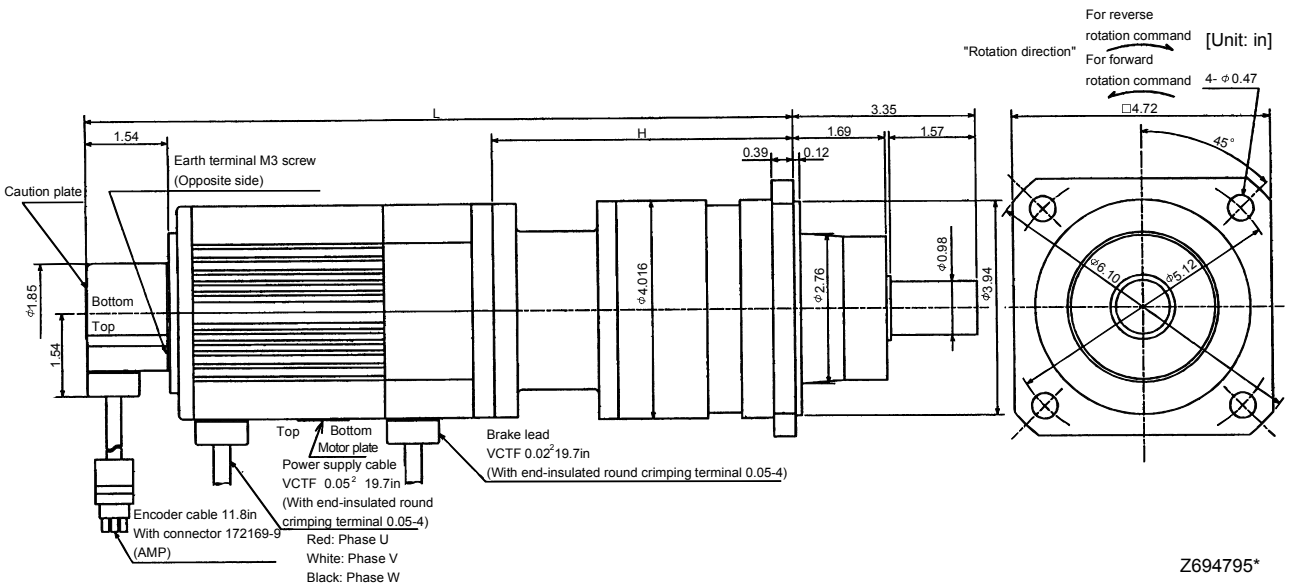
7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
HA-FF43BG2	400	326	BM4-05B-04MES	1/5	8.98	3 min. max.	18.7



Z694818*

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
		L	H						
HA-FF43BG2	400	13.09	5.551	326	BL1-09B-04MES	1/9	8.43	3 min. max.	19.8
HA-FF63BG2	600	13.29	5.157	326	BL1-05B-06MES	1/5	10.16	3 min. max.	21.2
HA-FF63BG2	600	13.68	5.551	326	BL1-09B-06MES	1/9	9.66	3 min. max.	21.2

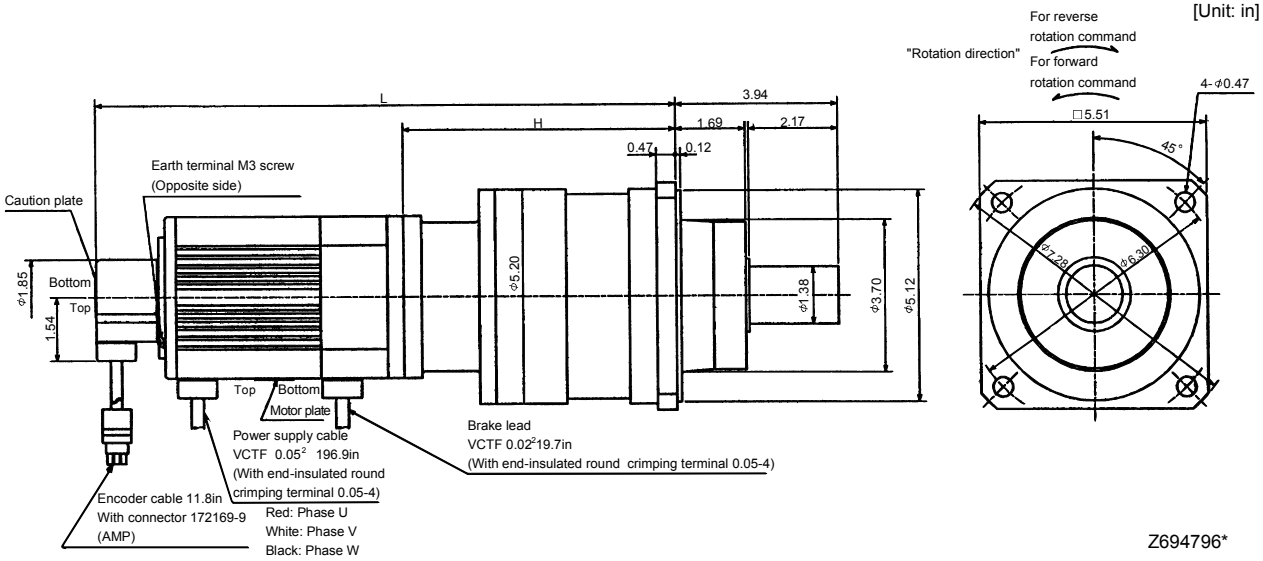


Z694795*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	H						
HA-FF43BG2	400	360.5	6.654	326	BL2-20B-04MES	1/20	14.91	3 min. max.	33.1
HA-FF43BG2	400	360.5	6.654	326	BL2-29B-04MES	1/29	12.90	3 min. max.	33.1
HA-FF43BG2	400	370.5	7.047	326	BL2-45B-04MES	1/45	9.50	3 min. max.	33.1
HA-FF63BG2	600	375.5	6.654	326	BL2-20B-06MES	1/20	16.14	3 min. max.	34.4
HA-FF63BG2	600	375.5	6.654	326	BL2-29B-06MES	1/29	14.13	3 min. max.	34.4

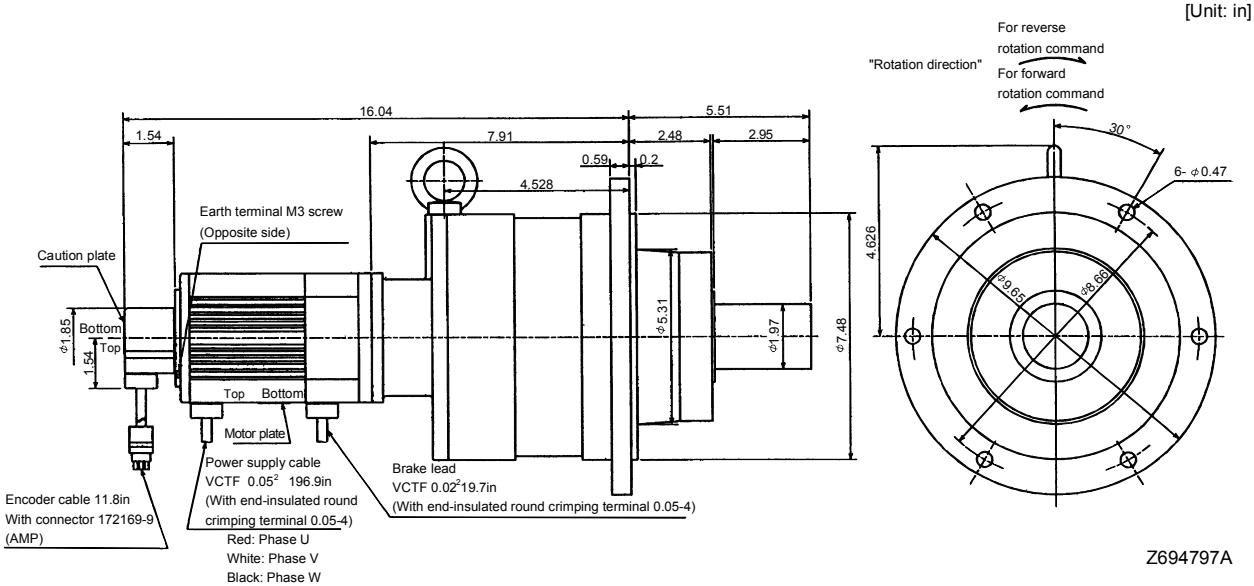
[Unit: in]



Z694796*

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HA-FF63BG2	600	326	BM3-45B-06MES	1/45	19.00	3 min. max.	74.3

[Unit: in]



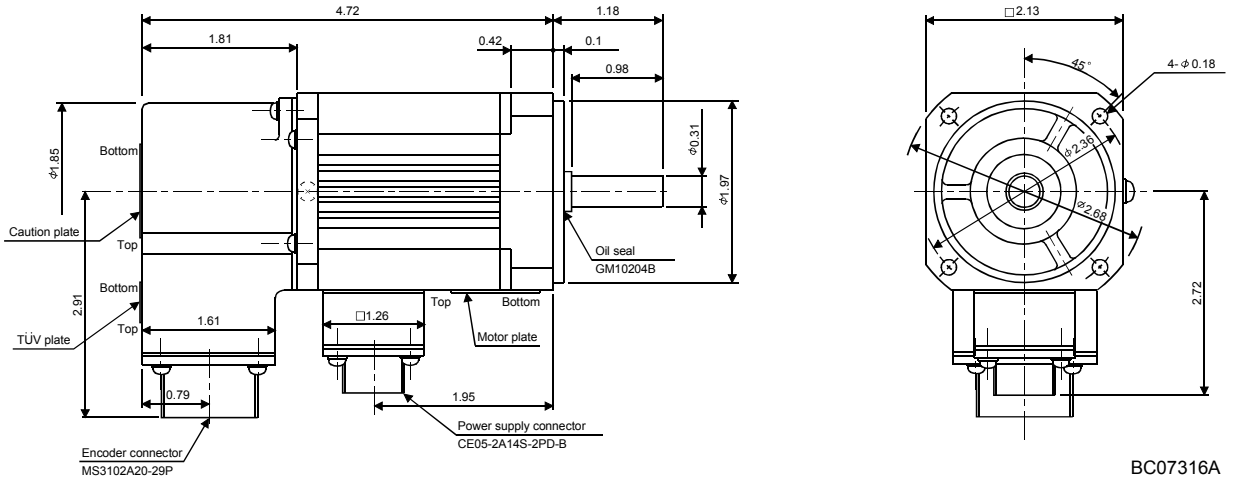
Z694797A

(5) EN・UL/C-UL Standard-Compliant model

(a) Standard (without electromagnetic brake, without reduction gear)

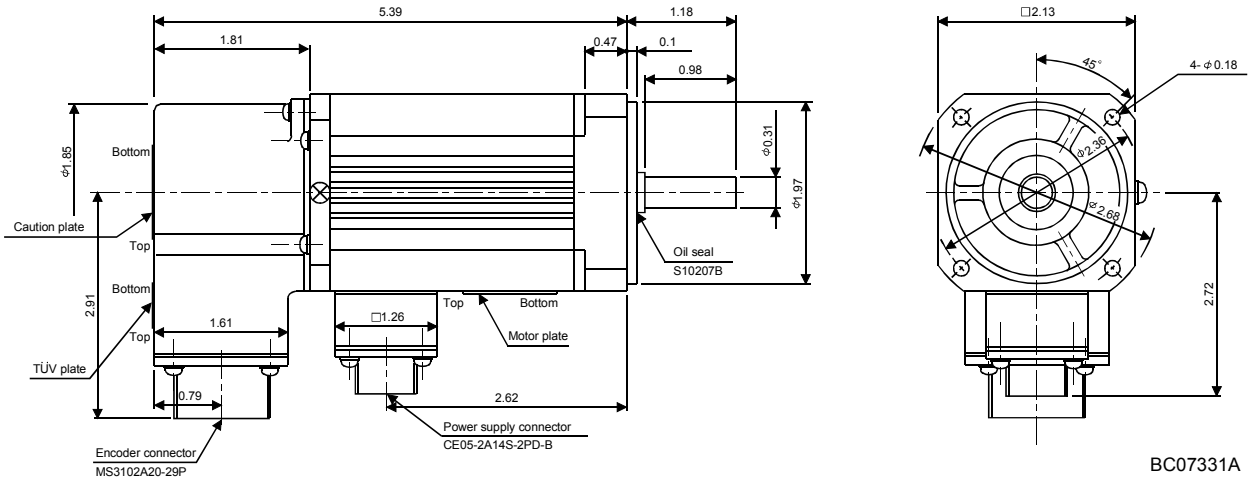
Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-FF053C-UE	50	0.342	4.0

[Unit: in]



Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-FF13C-UE	100	0.519	4.4

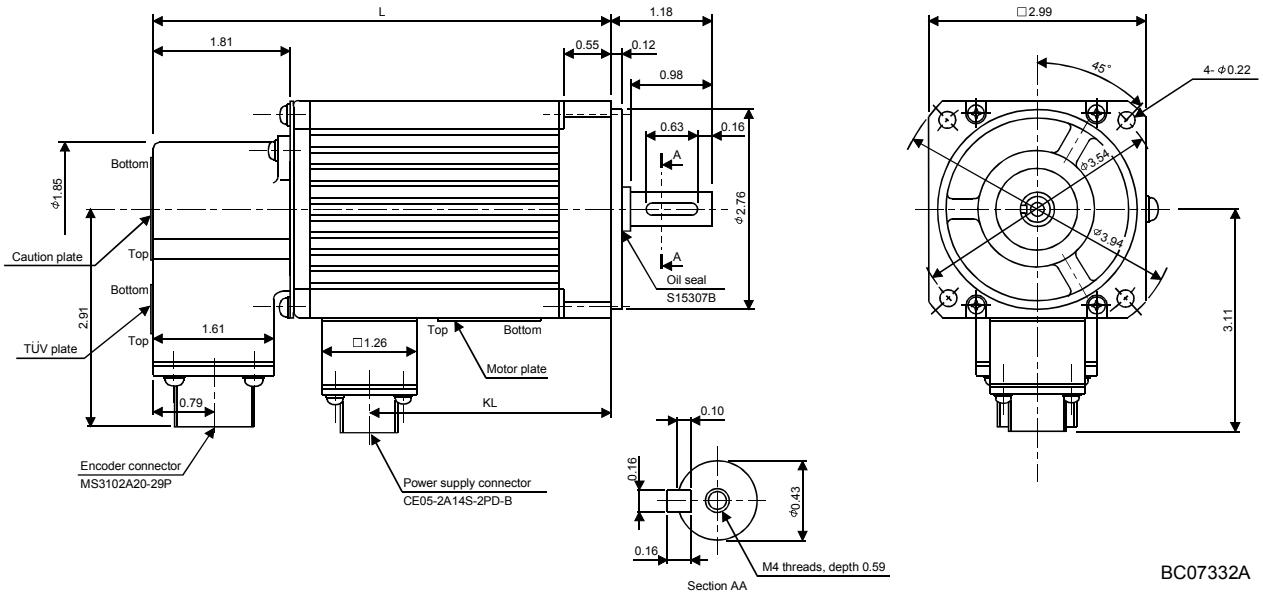
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

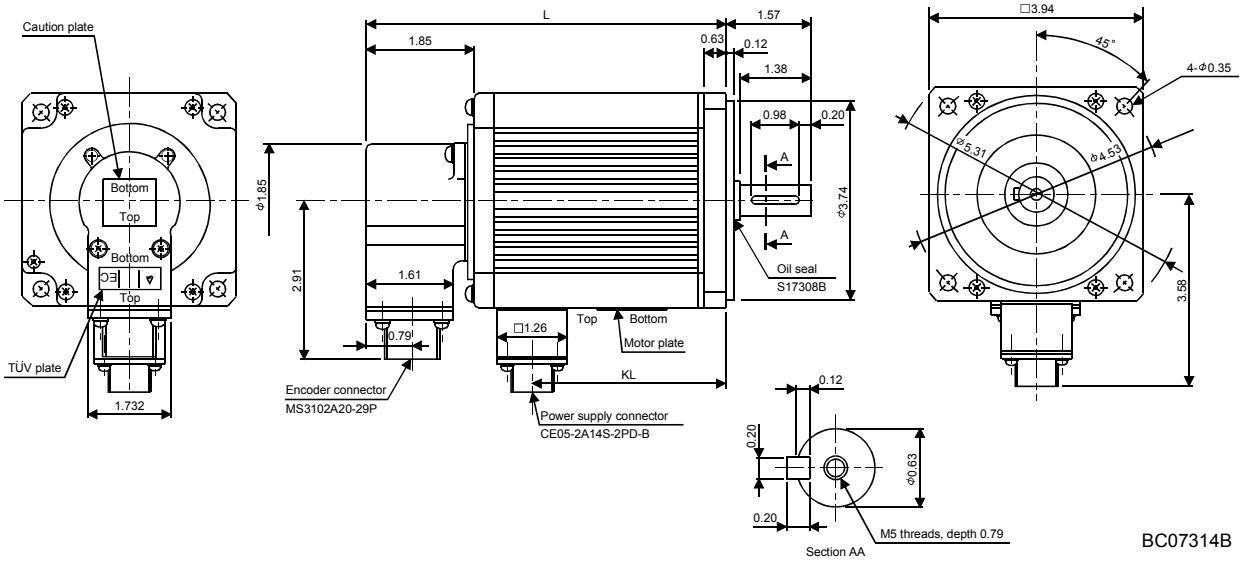
Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL		
HA-FF23C-UE	200	5.71	2.82	1.91	5.7
HA-FF33C-UE	300	6.38	3.50	2.73	6.4

[Unit: in]



Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL		
HA-FF43C-UE	400	6.65	3.66	5.33	10.4
HA-FF63C-UE	600	7.24	4.25	6.56	11.7

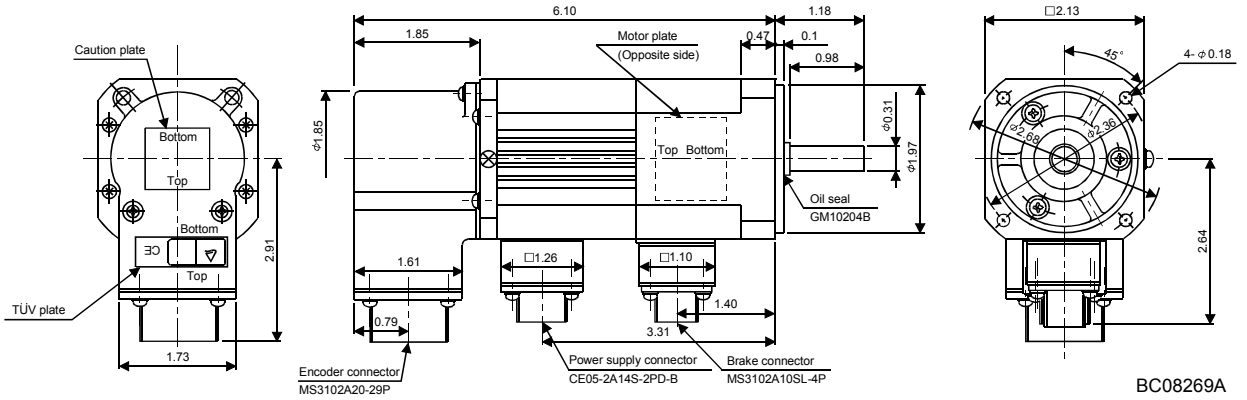
[Unit: in]



(b) With electromagnetic brake

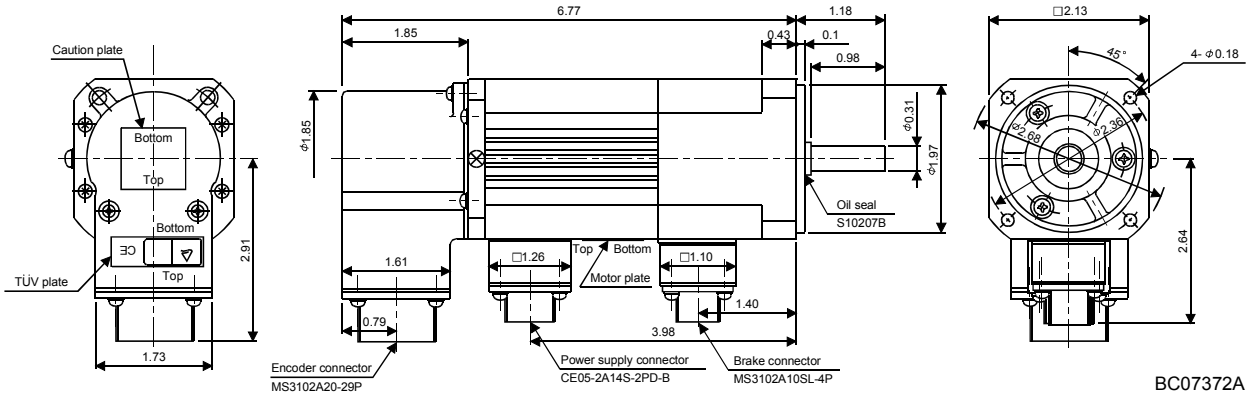
Model	Output [W]	Inertia Moment WK^2[oz ▪ in^2]	Brake static friction torque [oz ▪ in]	Mass [lb]
HA-FF053CB-UE	50	0.437	55	4.6

[Unit: in]



Model	Output [W]	Inertia Moment WK^2[oz ▪ in^2]	Brake static friction torque [oz ▪ in]	Mass [lb]
HA-FF13CB-UE	100	0.615	55	5.1

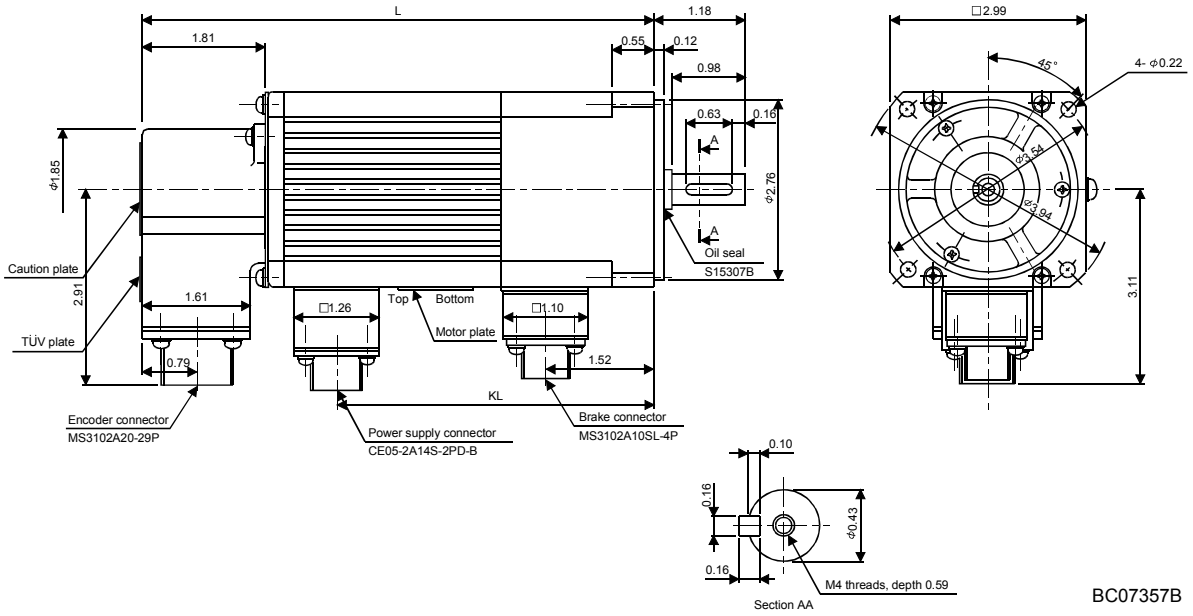
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HA-FF23CB-UE	200	7.17	4.29	170	2.64	7.7
HA-FF33CB-UE	300	7.87	5.0		3.46	8.4

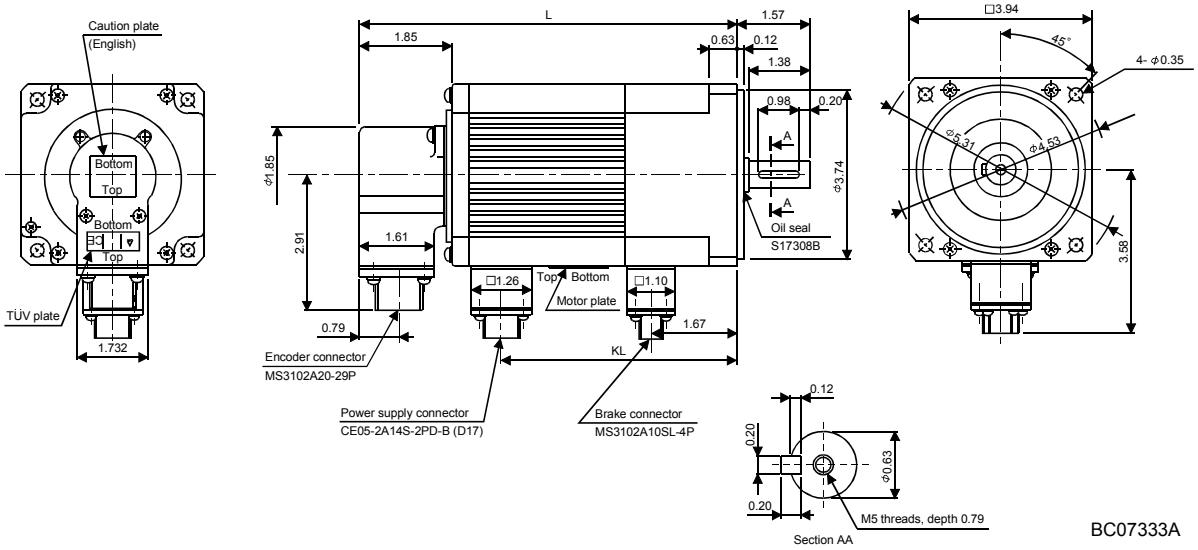
[Unit: in]



BC07357B

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HA-FF43CB-UE	400	8.11	5.12	326	7.24	12.8
HA-FF63CB-UE	600	8.70	5.71		8.47	14.1

[Unit: in]



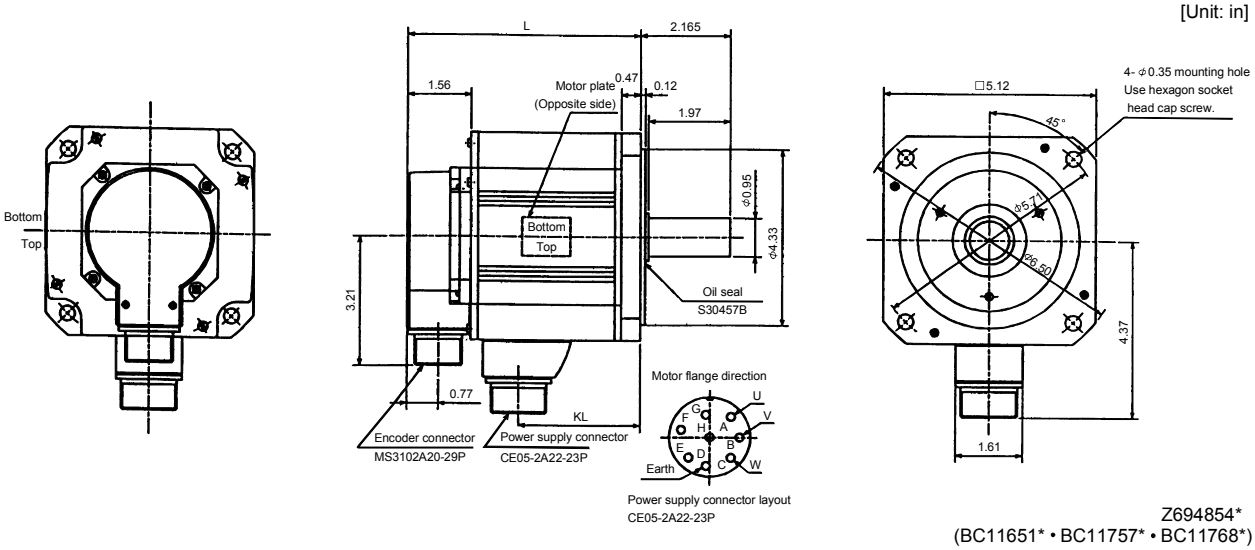
BC07333A

7.2.3 HC-SF・HC-SFS series

(1) Standard (without electromagnetic brake, without reduction gear)

Model			Output [kW]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
				L	KL		
HC-SF52 HC-SF53	HC-SFS52 HC-SFS53	HC-SFS524	0.5	4.72	2.03	36.22	11.0
HC-SF102 HC-SF103	HC-SFS102 HC-SFS103	HC-SFS1024	1.0	5.71	3.02	74.90	15.4
HC-SF81	HC-SFS81		0.85	6.69	4.00	109.08	19.8
HC-SF152 HC-SF153	HC-SFS152 HC-SFS153	HC-SFS1524	1.5				

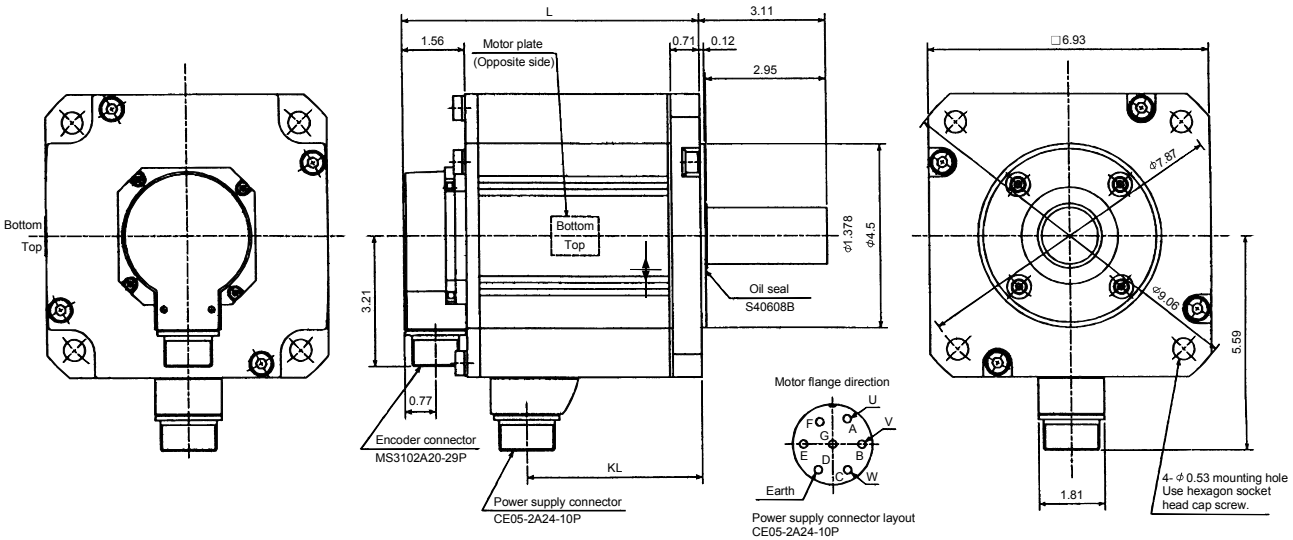
[Unit: in]



Z694854*
(BC11651*・BC11757*・BC11768*)

Model			Output [kW]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
				L	KL		
HC-SF121	HC-SFS121		1.2	5.71	2.70	232.37	26.5
HC-SF202 HC-SF203	HC-SFS202 HC-SFS203	HC-SFS2024	2.0				
HC-SF201	HC-SFS201		2.0	7.36	4.35	448.33	41.9
HC-SF352 HC-SF353	HC-SFS352 HC-SFS353	HC-SFS3524	3.5				

[Unit: in]

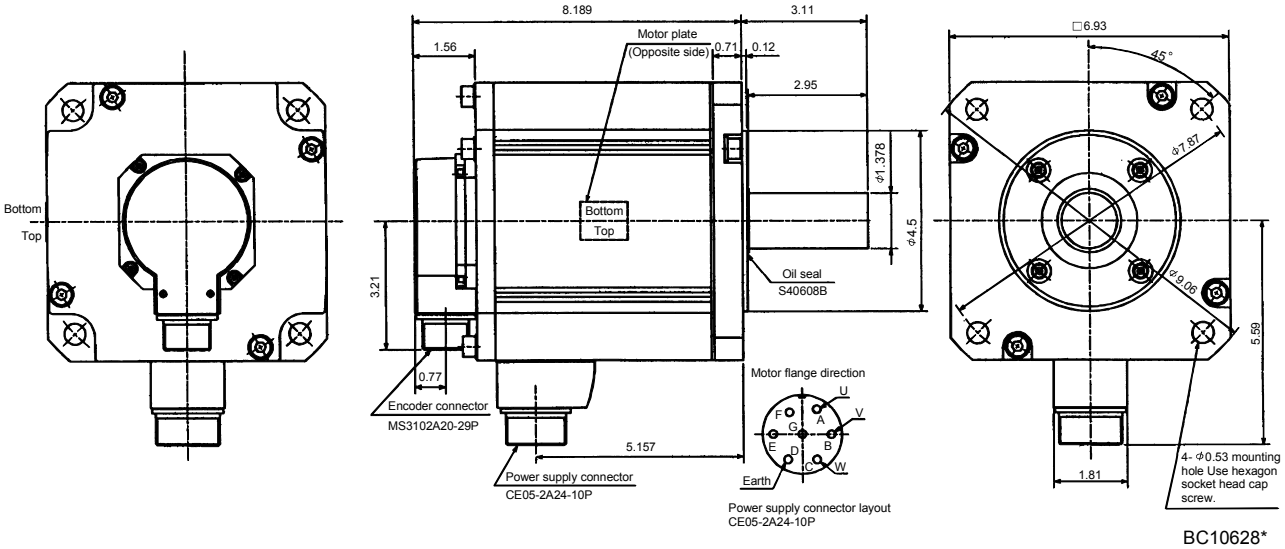


Z695393A
(BC11769*・BC11652*・BC11758*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF301 HC-SFS301	3.0	552.212	50.7

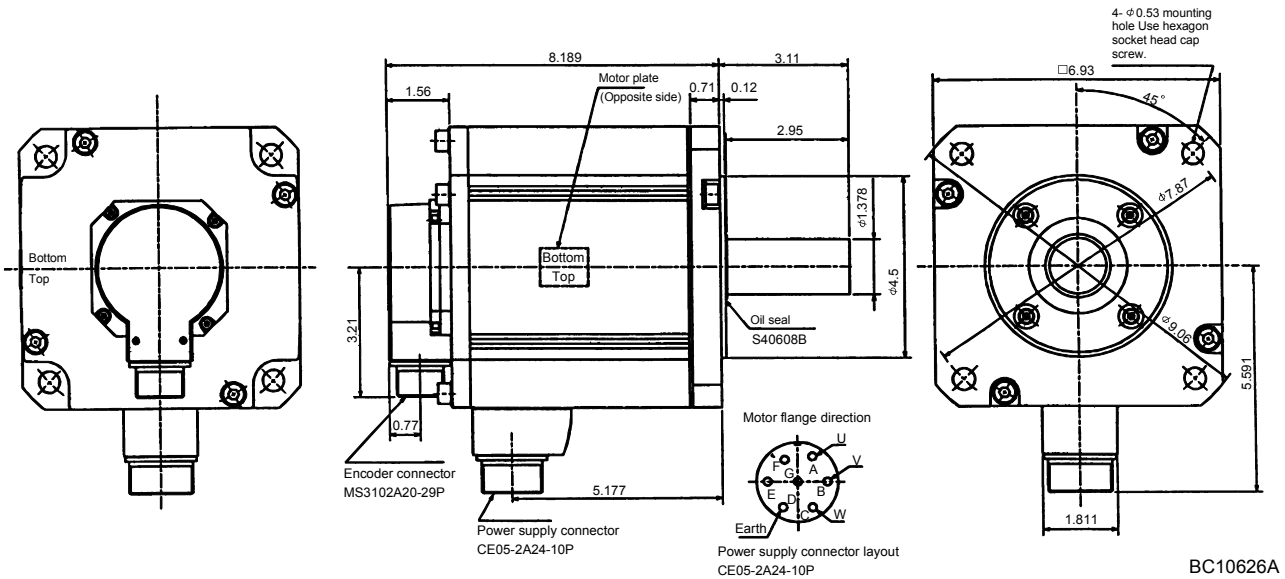
[Unit: in]



BC10628*
(BC11769*)

Model	Output [kW]	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF502 HC-SFS502 HC-SFS5024	5.0	552.212	50.7

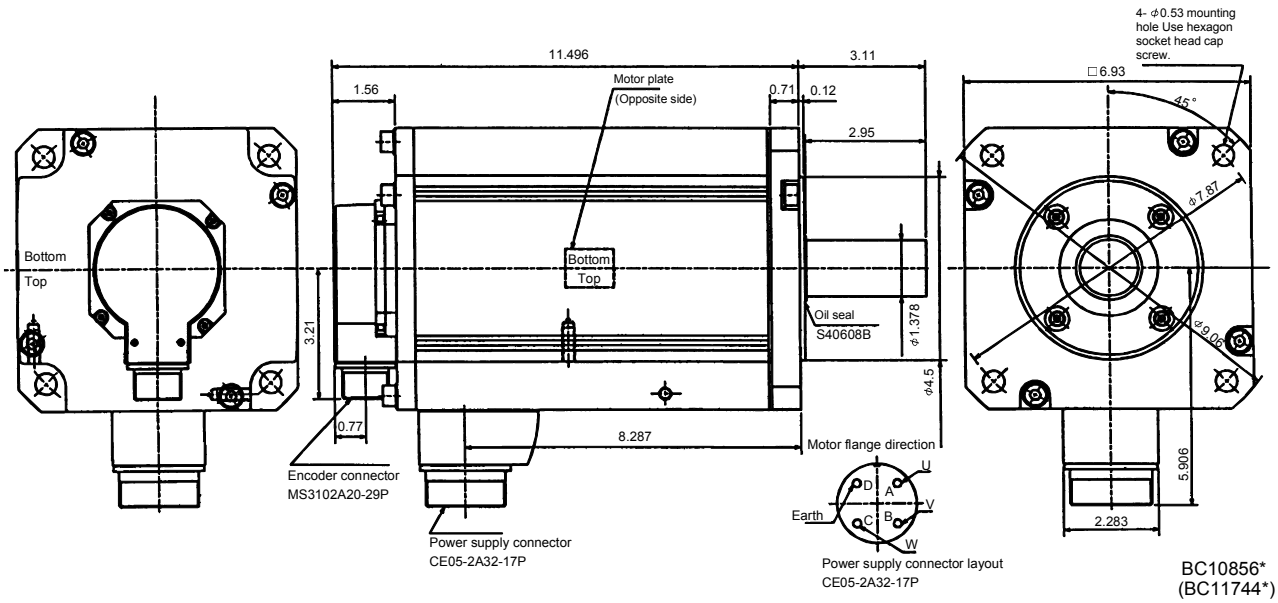
[Unit: in]



BC10626A
(BC11743*)

Model		Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-SF702	HC-SFS702 HC-SFS7024	7.0	874.791	70.5

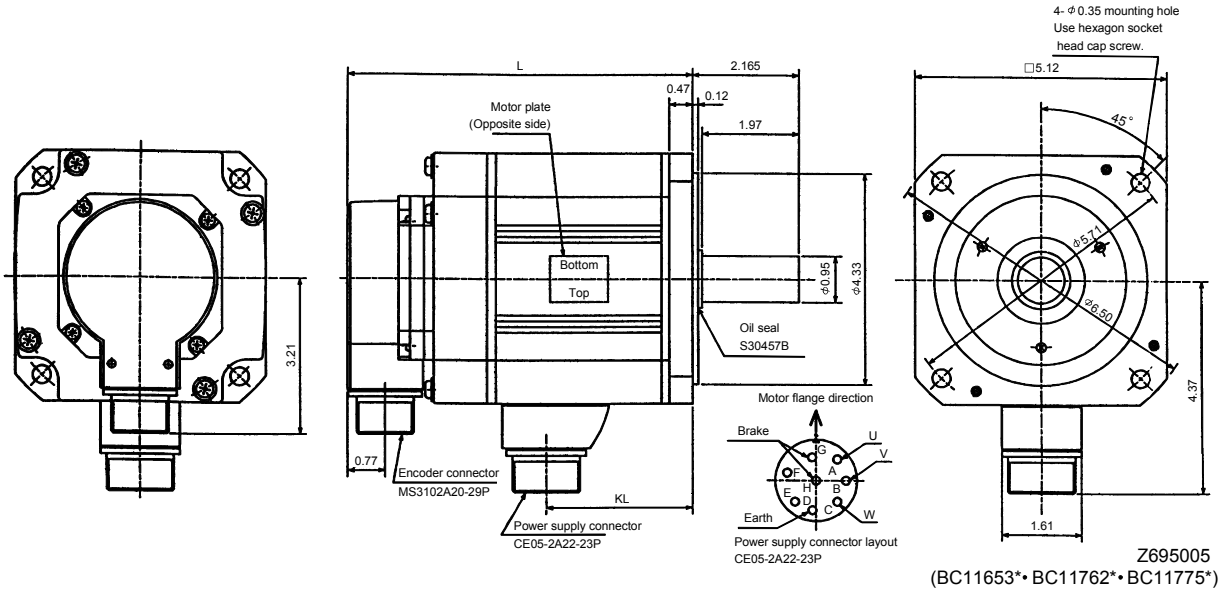
[Unit: in]



(2) With electromagnetic brake

Model		Output [kW]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
			L	KL			
HC-SF52B HC-SF53B	HC-SFS52B HC-SFS53B HC-SFS524B	0.5	6.02	2.03	1204	45.52	16.535
HC-SF102B HC-SF103B	HC-SFS102B HC-SFS103B HC-SFS1024B	1.0	7.01	3.02	1204	84.20	20.944
HC-SF81B	HC-SFS81B	0.85	7.99	4.00	1204	118.37	25.353
HC-SF152B HC-SF153B	HC-SFS152B HC-SFS153B HC-SFS1524B	1.5					

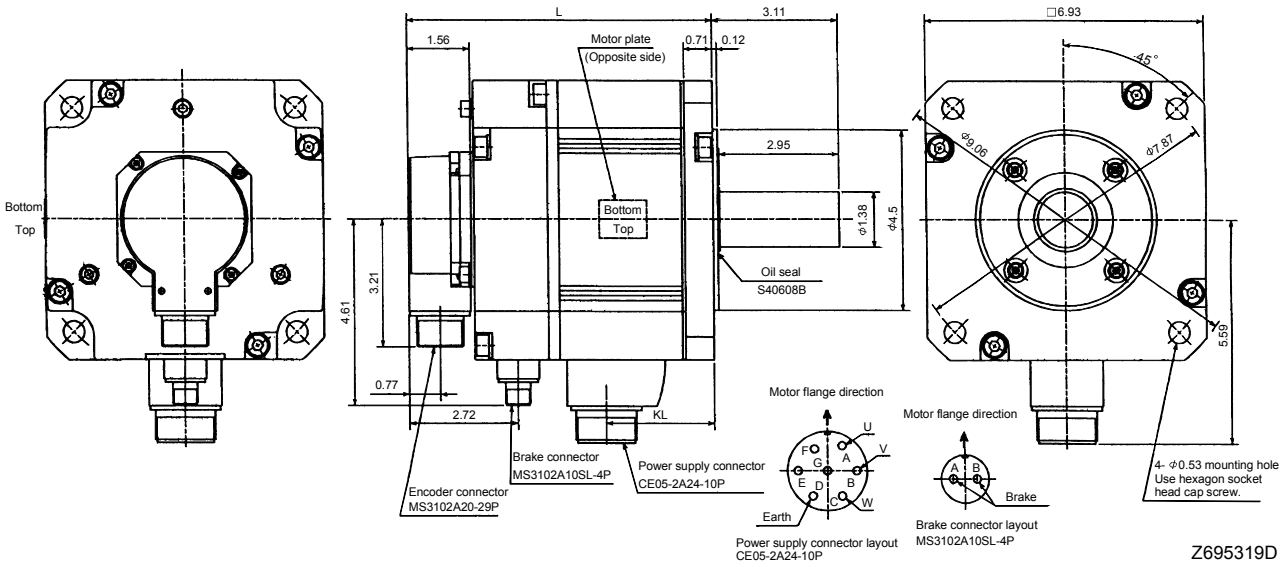
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
			L	KL			
HC-SF121B	HC-SFS 121B	1.2	7.60	2.70	6103	287.04	39.683
HC-SF202B HC-SF203B	HC-SFS 202B HC-SFS 203B HC-SFS 2024B	2.0					
HC-SF201B	HC-SFS 201B	2.0	9.25	4.35	6103	503.01	55.115
HC-SF352B HC-SF353B	HC-SFS 352B HC-SFS 353B HC-SFS3524B	3.5					

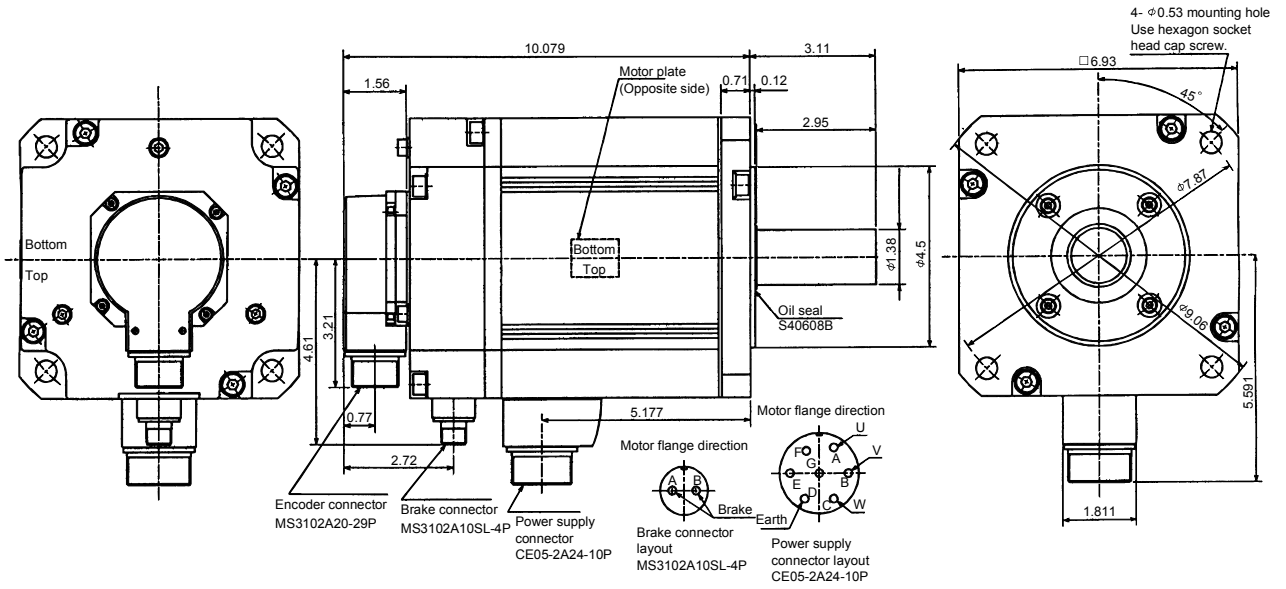
[Unit: in]



Z695319D
(BC11654*•BC11763*•BC11776*)

Model		Output [kW]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-SF301B	HC-SFS301B	3.0	6103	606.886	63.9

[Unit: in]

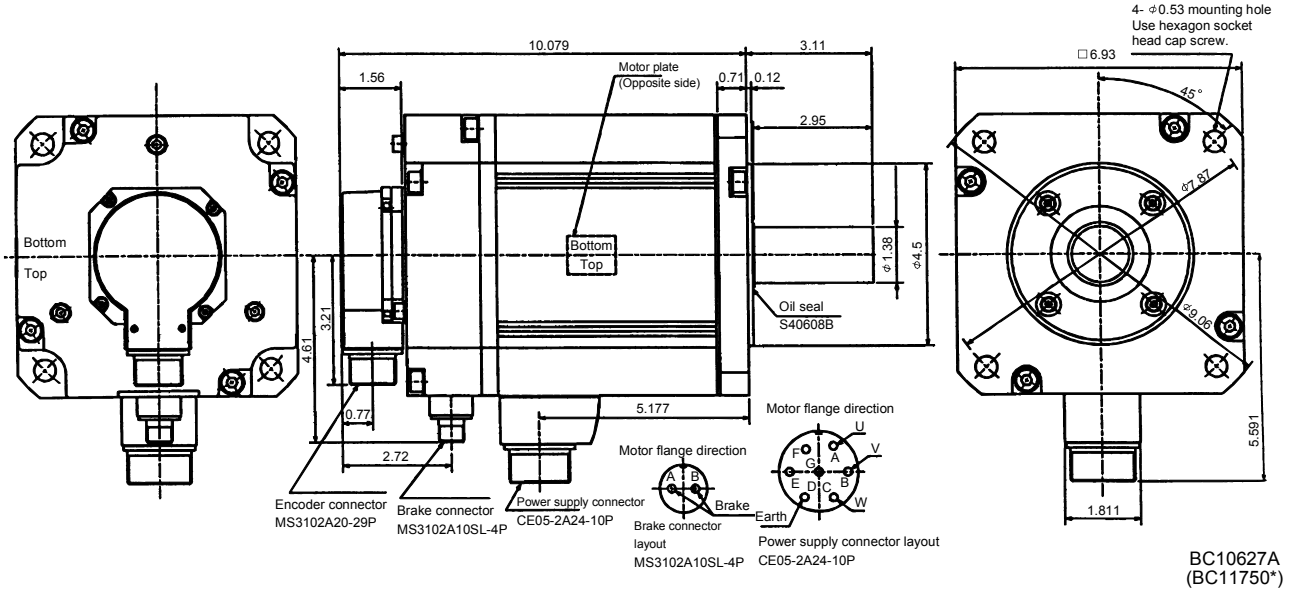


BC10823*
(BC11776*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-SF502B	HC-SFS502B HC-SFS5024B	5.0	6103	606.886	63.9

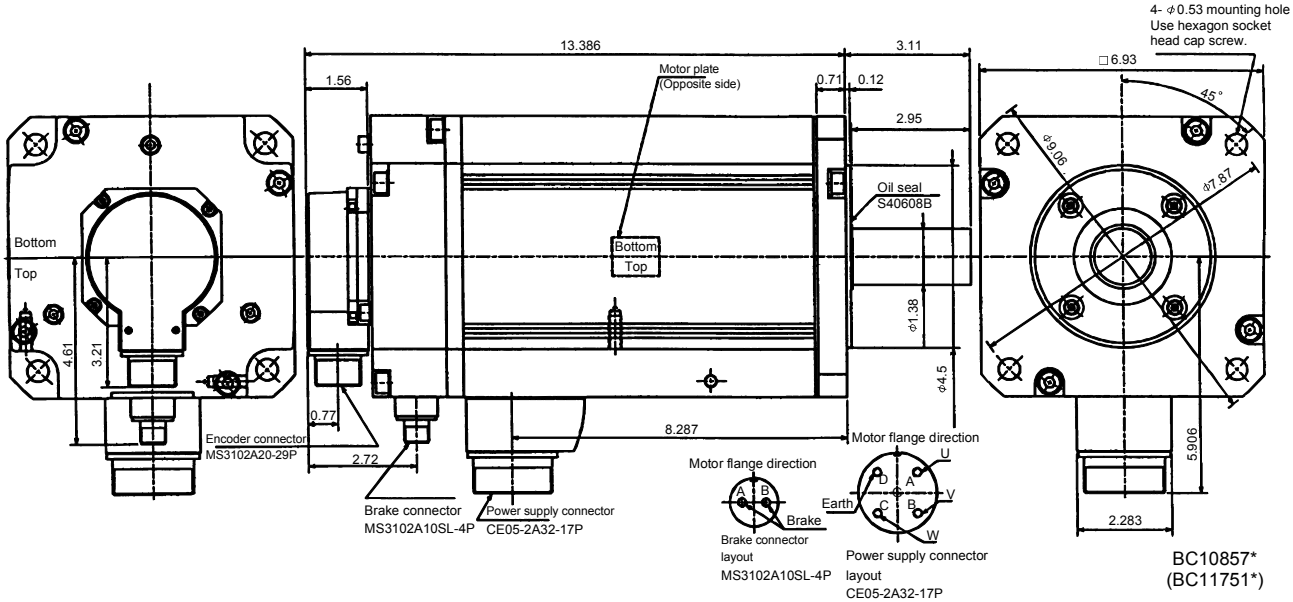
[Unit: in]



BC10627A
(BC11750*)

Model		Output [kW]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-SF702B	HC-SFS702B HC-SFS7024B	7.0	6103	929.466	83.8

[Unit: in]



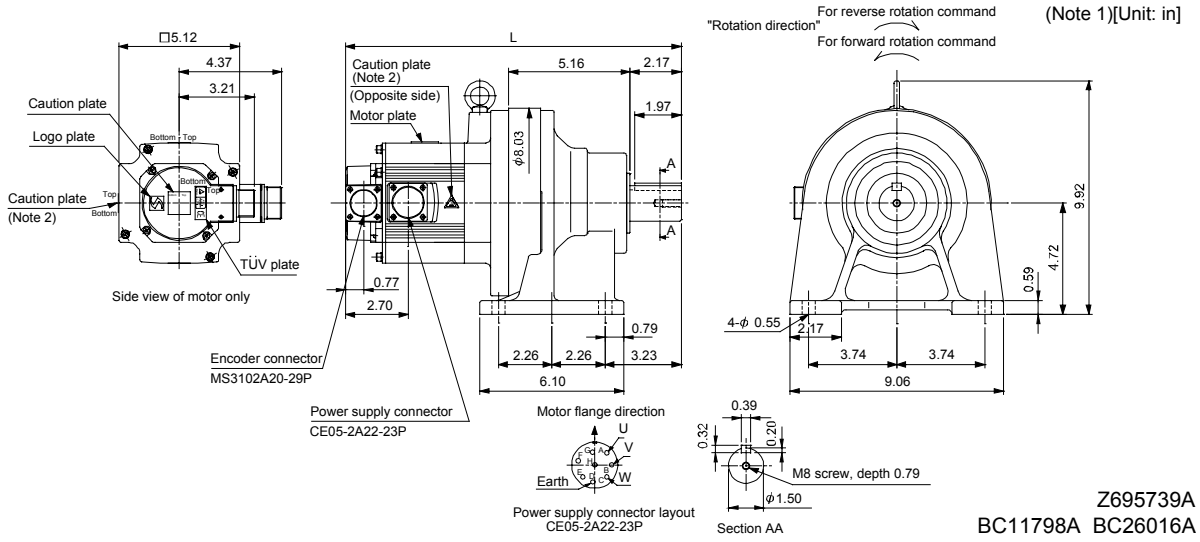
BC10857*
(BC11751*)

(3) With reduction gear for general industrial machine (leg type)

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

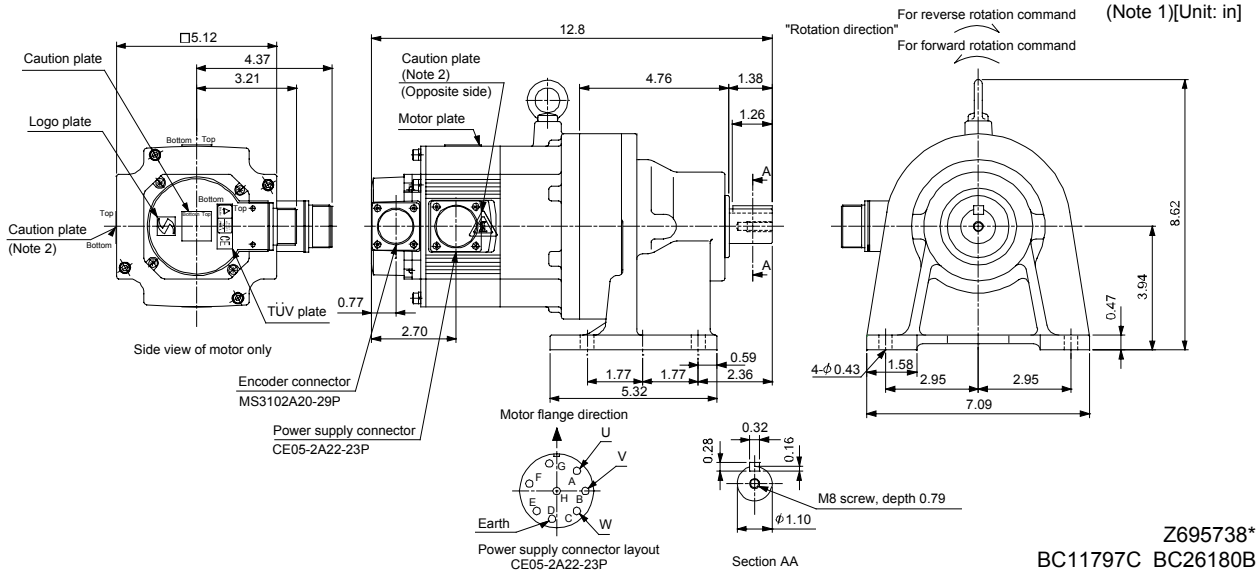
(a) Without electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/35	41.01	13.31	61.7
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/43	40.73	13.31	61.7
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/59	40.60	13.31	61.7
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/6	91.85	14.30	66.1
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/11	83.7	14.30	66.1
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/17	81.47	14.30	66.1
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/29	79.83	14.30	66.1
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/35	79.8	14.30	66.1
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/6	126.3	15.28	70.5
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/11	117.55	15.28	70.5
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/17	115.9	15.28	70.5



Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/6	40.05	46.3
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/11	38.00	46.3
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/17	37.45	46.3
HC-SF52G1H	HC-SFS52G1H	HC-SFS524G1H	0.5	1/29	37.04	46.3

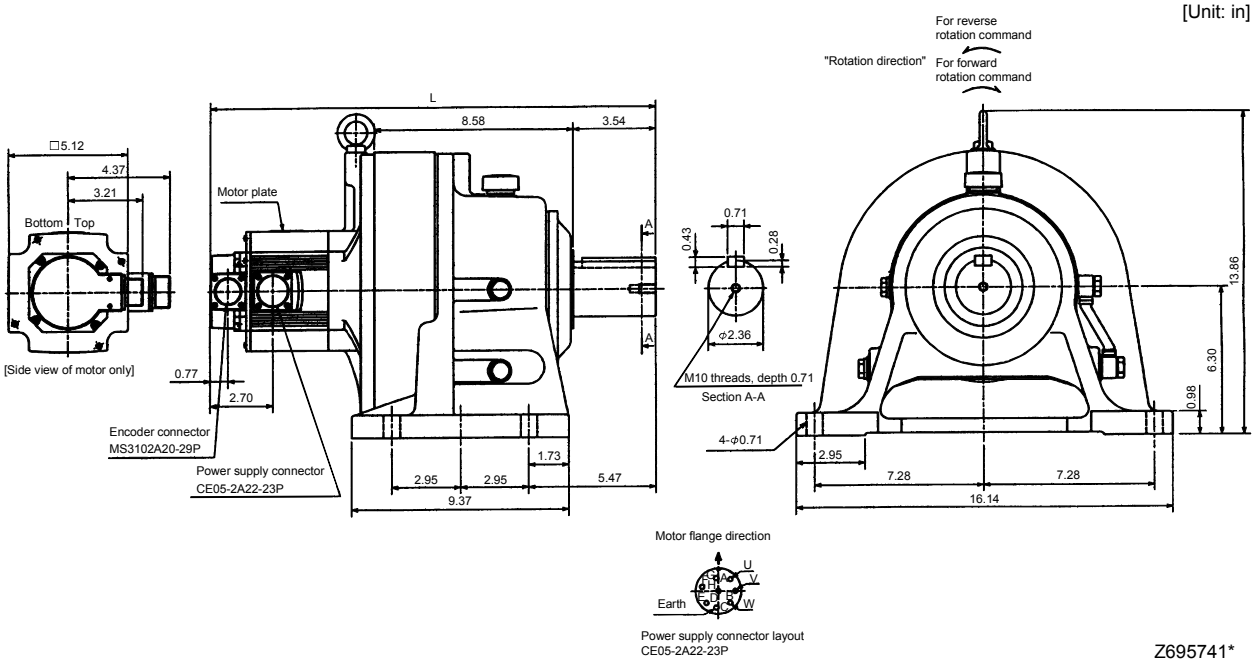


Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/59	106.51	19.21	198.4
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/43	141.06	20.20	202.8
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/59	140.68	20.20	202.8

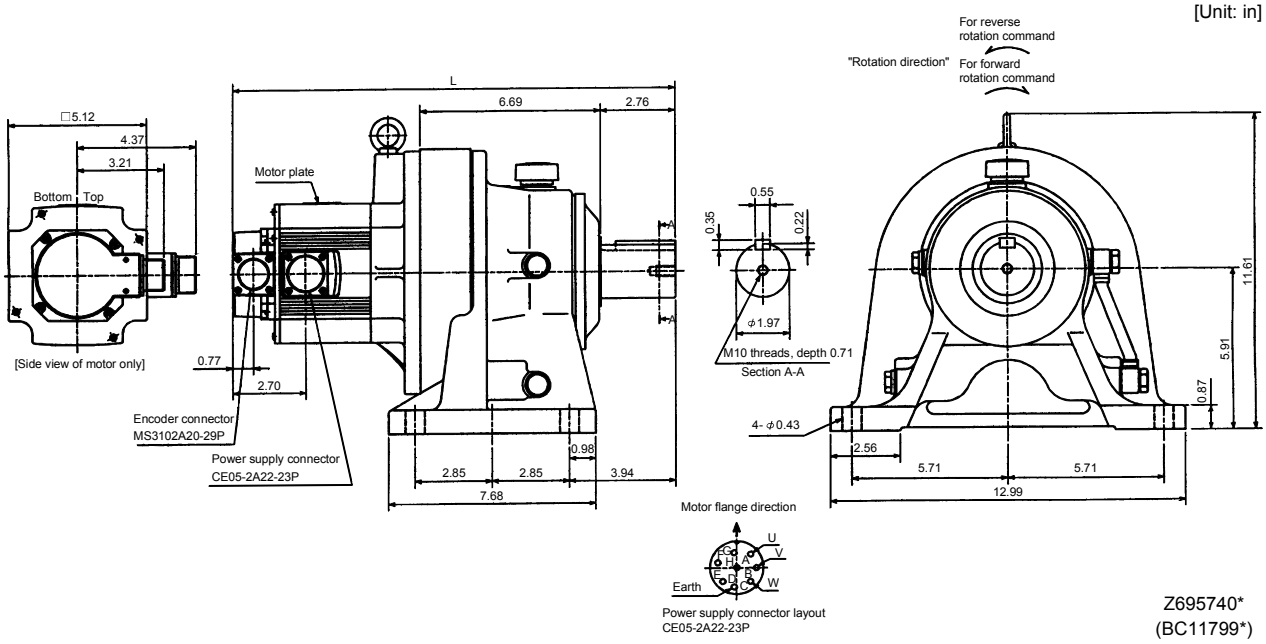
[Unit: in]



Z695741*
(BC11800*)

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF102G1H	HC-SFS102G1H	HC-SFS1024G1H	1.0	1/43	85.57	16.38	112.4
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/29	120.72	17.36	116.8
HC-SF152G1H	HC-SFS152G1H	HC-SFS1524G1H	1.5	1/35	120.45	17.36	116.8

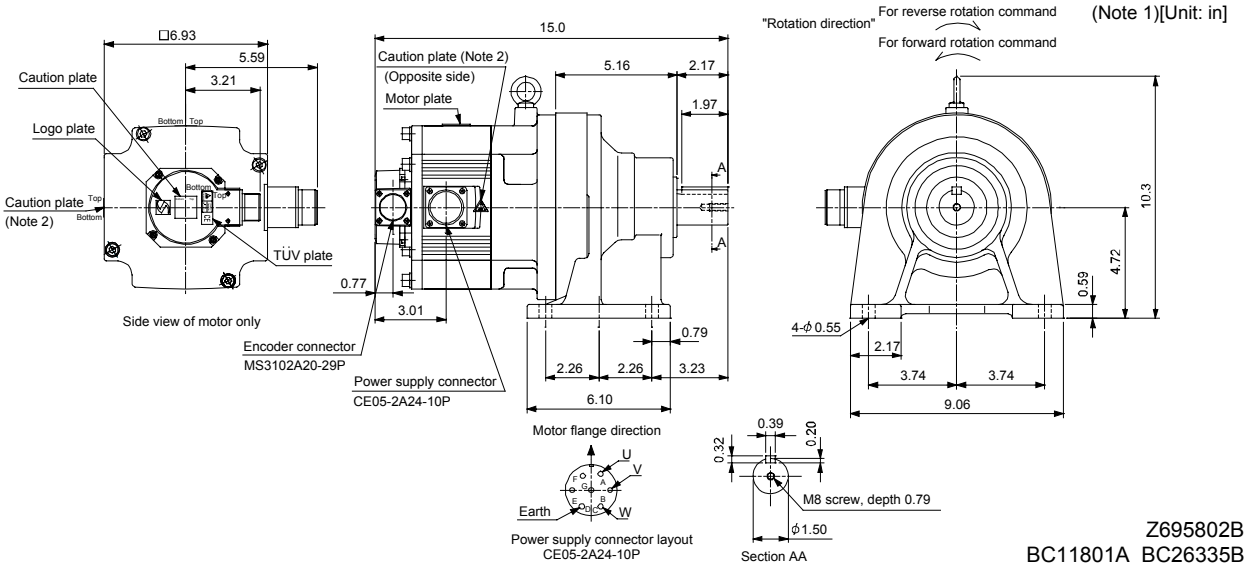
[Unit: in]



Z695740*
(BC11799*)

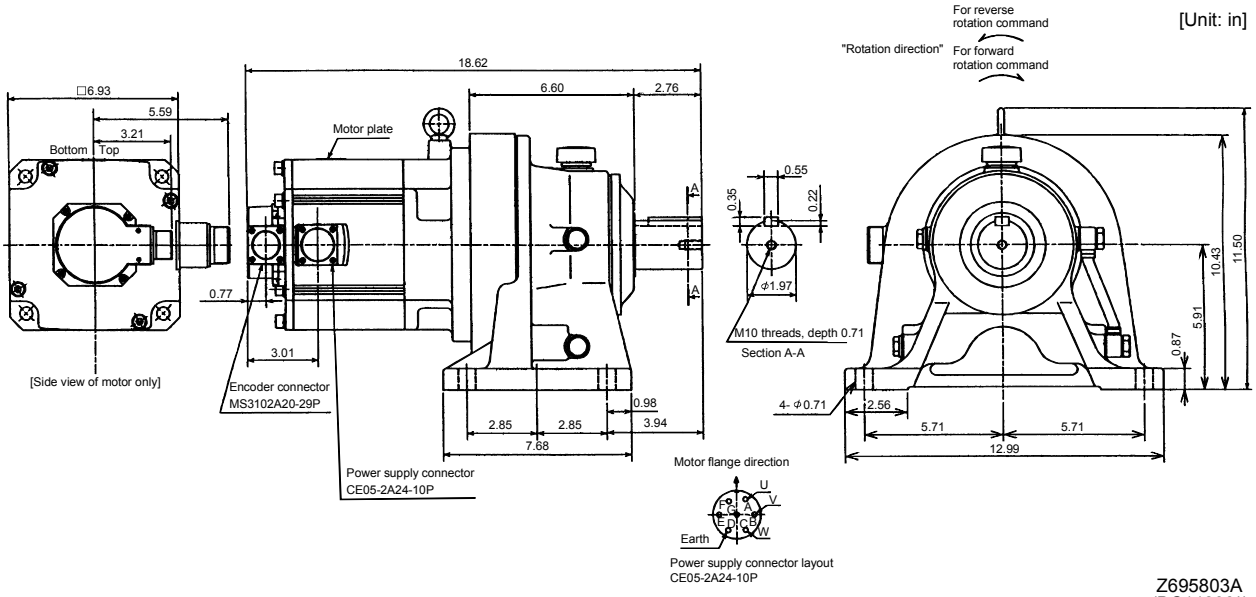
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/6	249.32	77.2
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/11	241.11	77.2
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/17	238.93	77.2



Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

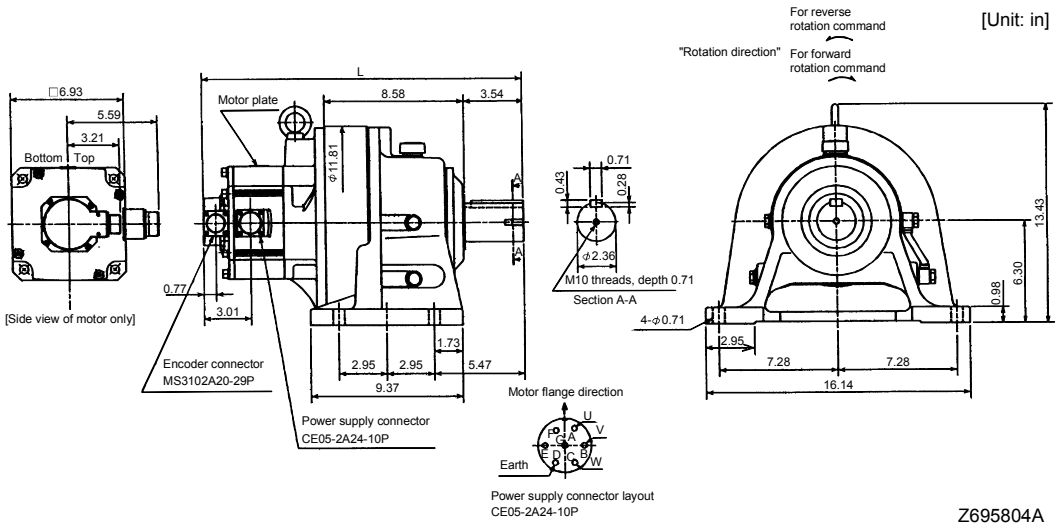
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/6	492.62	132.3
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/11	471.21	132.3
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/17	464.73	132.3



7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/29	267.36	19.61	200.6
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/35	265.72	19.61	200.6
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/43	264.62	19.61	200.6
HC-SF202G1H	HC-SFS202G1H HC-SFS2024G1H	2.0	1/59	464.08	19.61	200.6
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/29	483.32	21.26	216.1
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/35	481.68	21.26	216.1

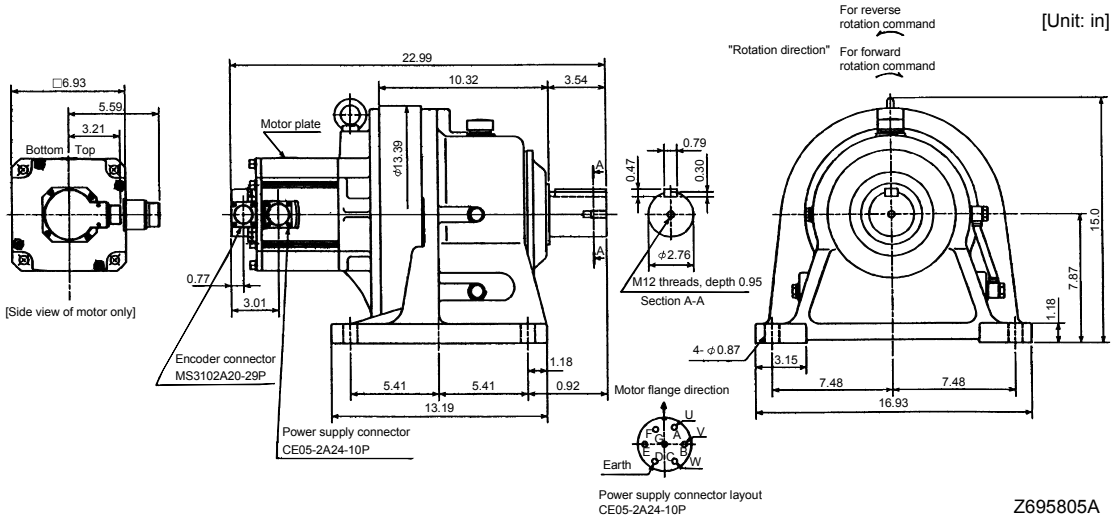
[Unit: in]



Z695804A
(BC11802*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/43	582.28	306.4
HC-SF352G1H	HC-SFS352G1H HC-SFS3524G1H	3.5	1/59	579.0	306.4

[Unit: in]

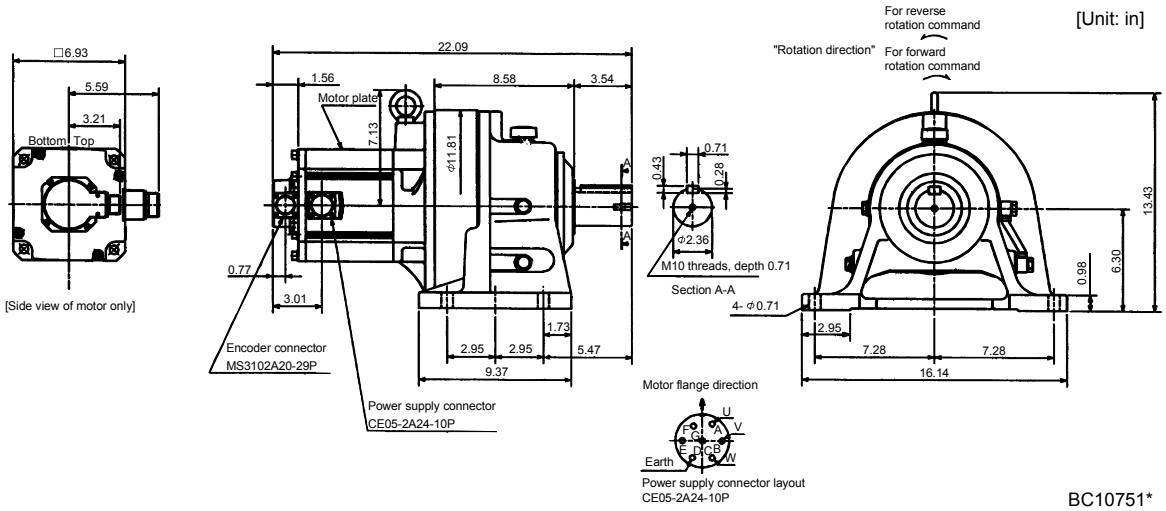


Z695805A
(BC11804*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/11	620.01	225
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/17	598.14	225

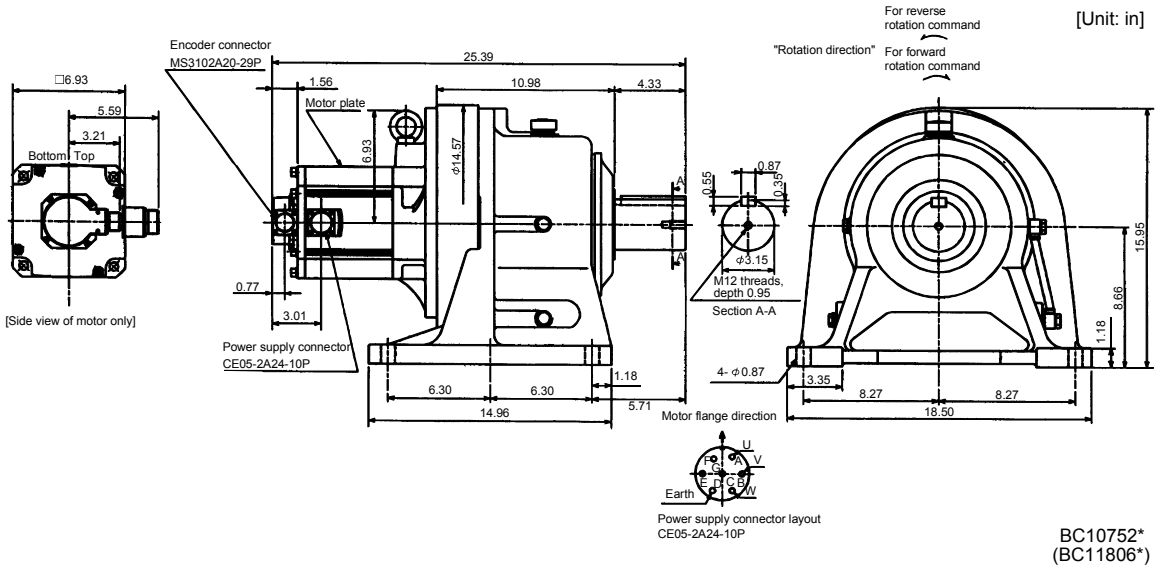
[Unit: in]



BC10751*
(BC11805*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/29	757.24	377
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/35	754.51	377
HC-SF502G1H	HC-SFS502G1H HC-SFS5024G1H	5.0	1/43	749.04	377

[Unit: in]

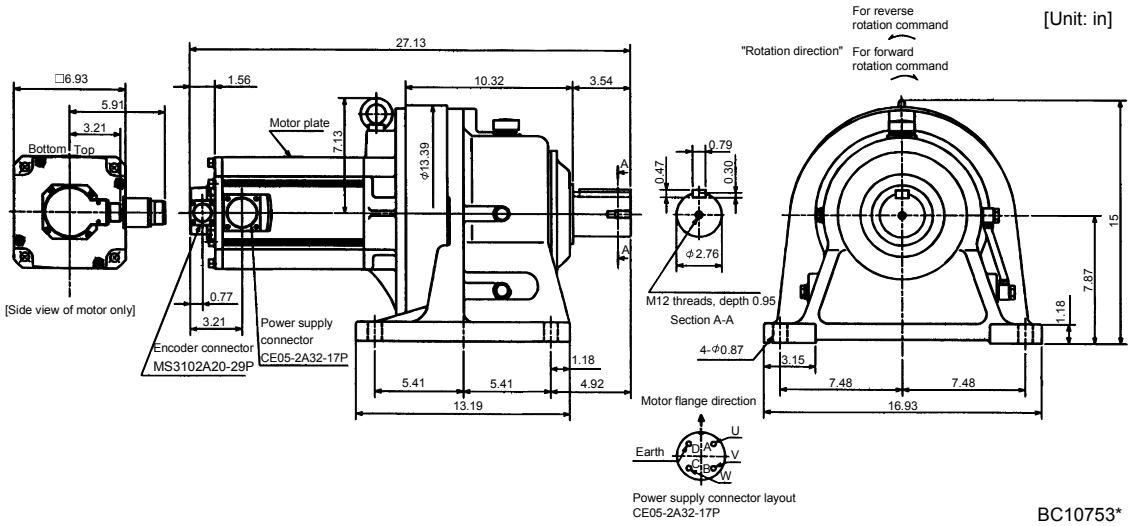


BC10752*
(BC11806*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/11	1086.93	304
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/17	1038.82	304

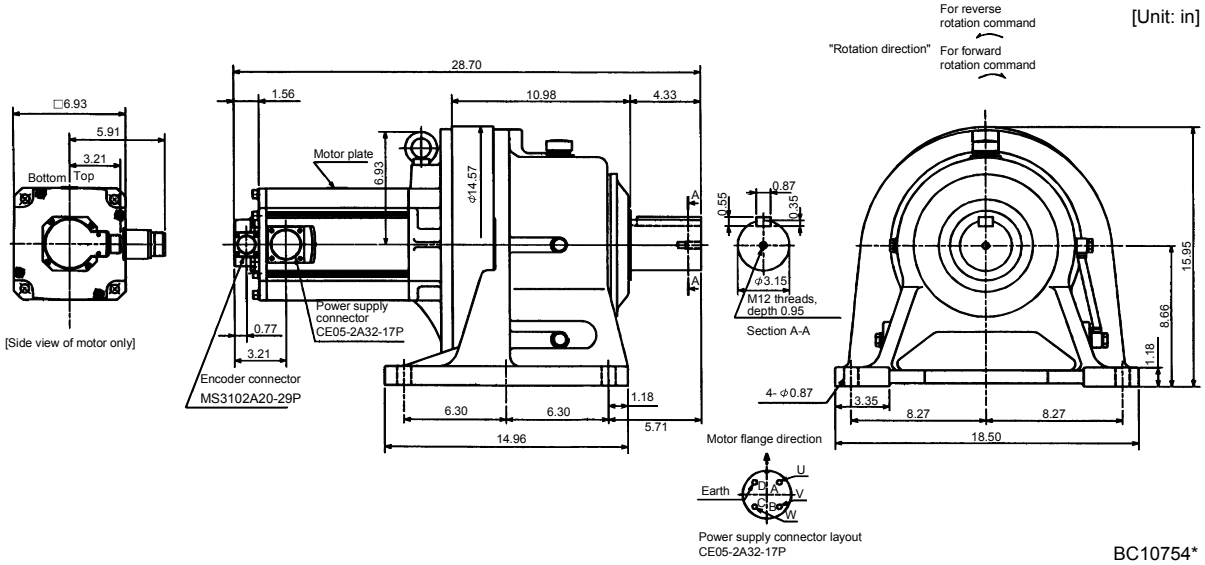
[Unit: in]



BC10753*
(BC11807*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/29	1079.82	397
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/35	1077.09	397

[Unit: in]

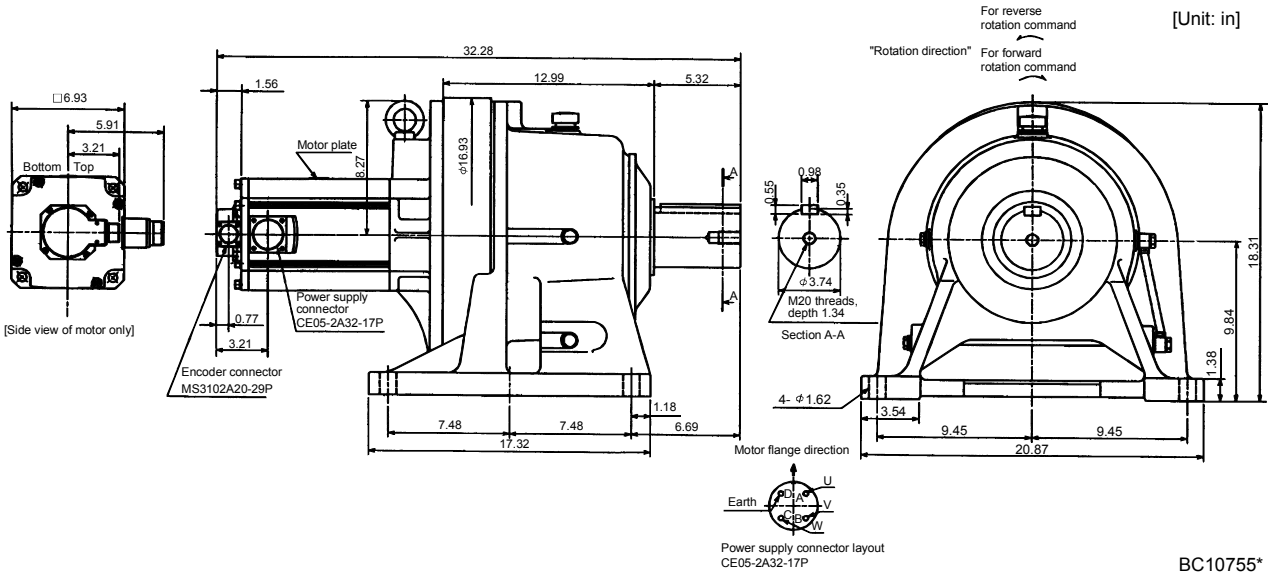


BC10754*
(BC11808*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF702G1H	HC-SFS702G1H HC-SFS7024G1H	7.0	1/43	1404.04	575

[Unit: in]

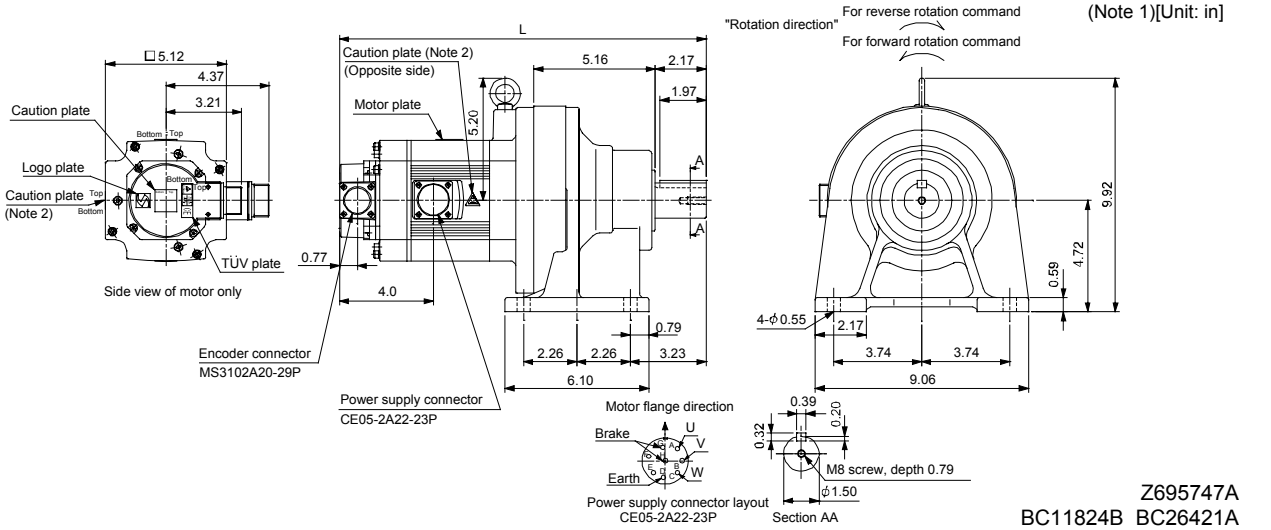


BC10755*
(BC11809*)

(b) With electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz・in]
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/35	50.3	14.61	72.8	1175
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/43	50.03	14.61	72.8	1175
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/59	49.89	14.61	72.8	1175
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/6	101.15	15.59	77.2	1175
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/11	92.9	15.59	77.2	1175
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/17	90.76	15.59	77.2	1175
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/29	89.12	15.59	77.2	1175
HC-SF102BG1H	HC-SFS102BG1H	HC-SFS1024BG1H	1.0	1/35	89.1	15.59	77.2	1175
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/6	135.6	16.58	81.6	1175
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/11	126.85	16.58	81.6	1175
HC-SF152BG1H	HC-SFS152BG1H	HC-SFS1524BG1H	1.5	1/17	125.2	16.58	81.6	1175

(Note 1)[Unit: in]

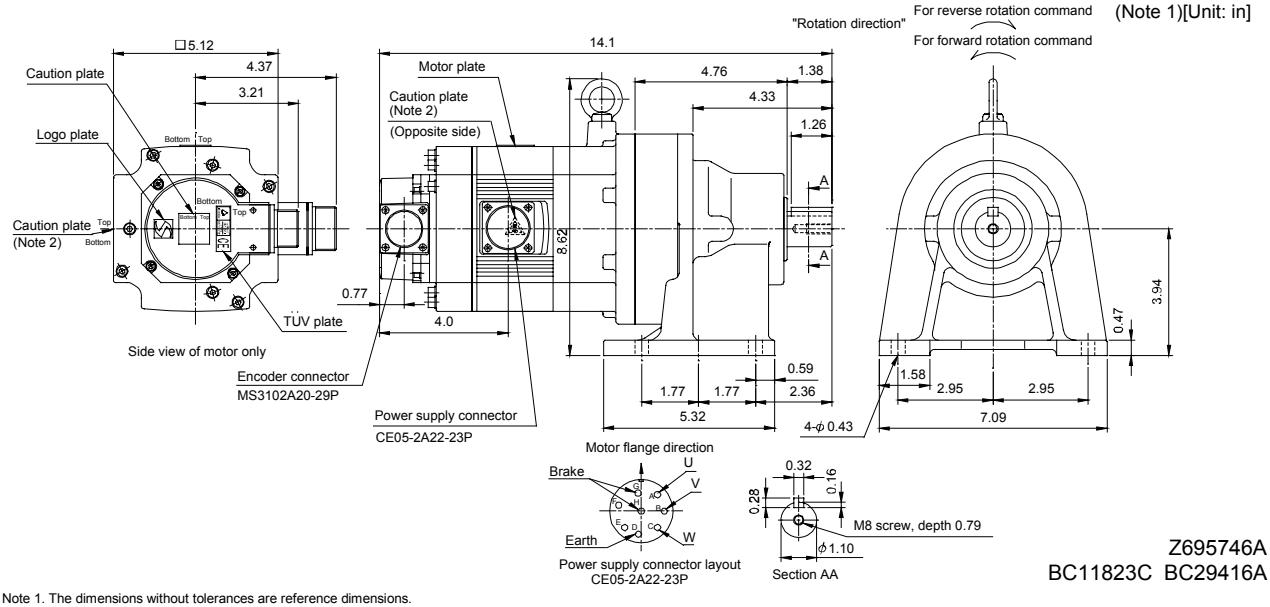


Z695747A
BC11824B BC26421A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [oz・in]
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/6	49.34	50.7	1175
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/11	47.29	50.7	1175
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/17	46.75	50.7	1175
HC-SF52BG1H	HC-SFS52BG1H	HC-SFS524BG1H	0.5	1/29	46.34	50.7	1175

(Note 1)[Unit: in]



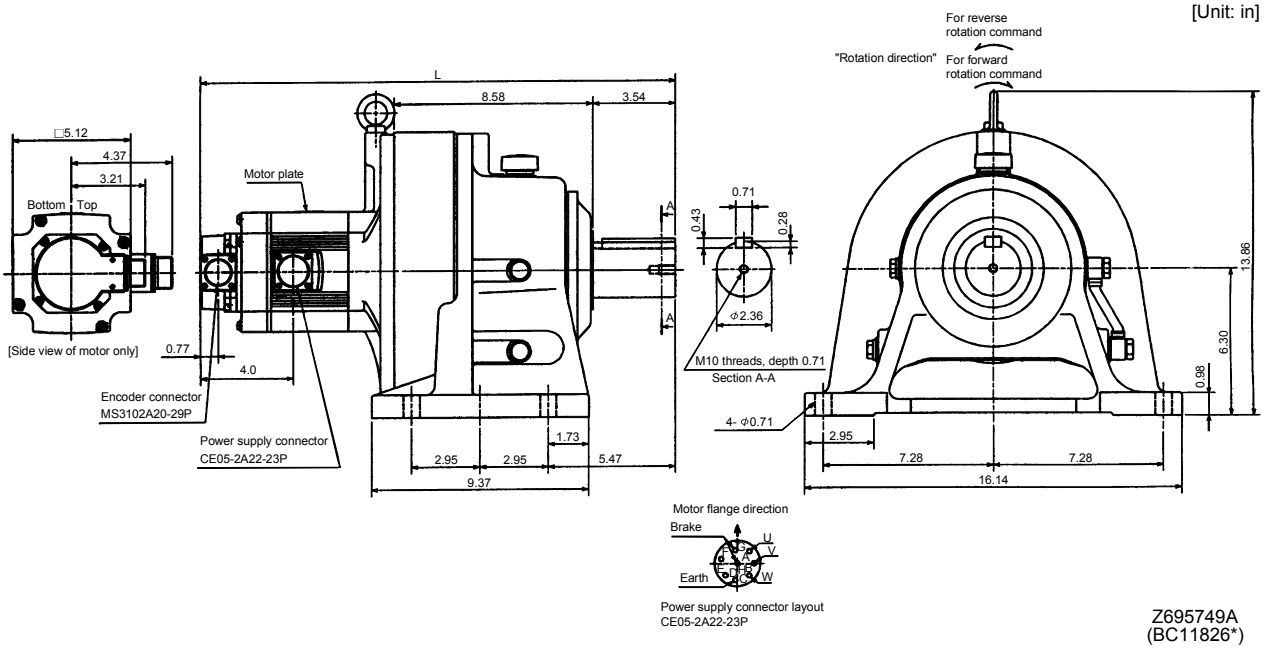
Z695746A
BC11823C BC29416A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz · in]
HC-SF102BG1H	HC-SFS102BG1H HC-SFS1024BG1H	1.0	1/59	115.80	20.51	202.8	1175
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/43	150.36	21.50	207.2	1175
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/59	149.97	21.50	207.2	1175

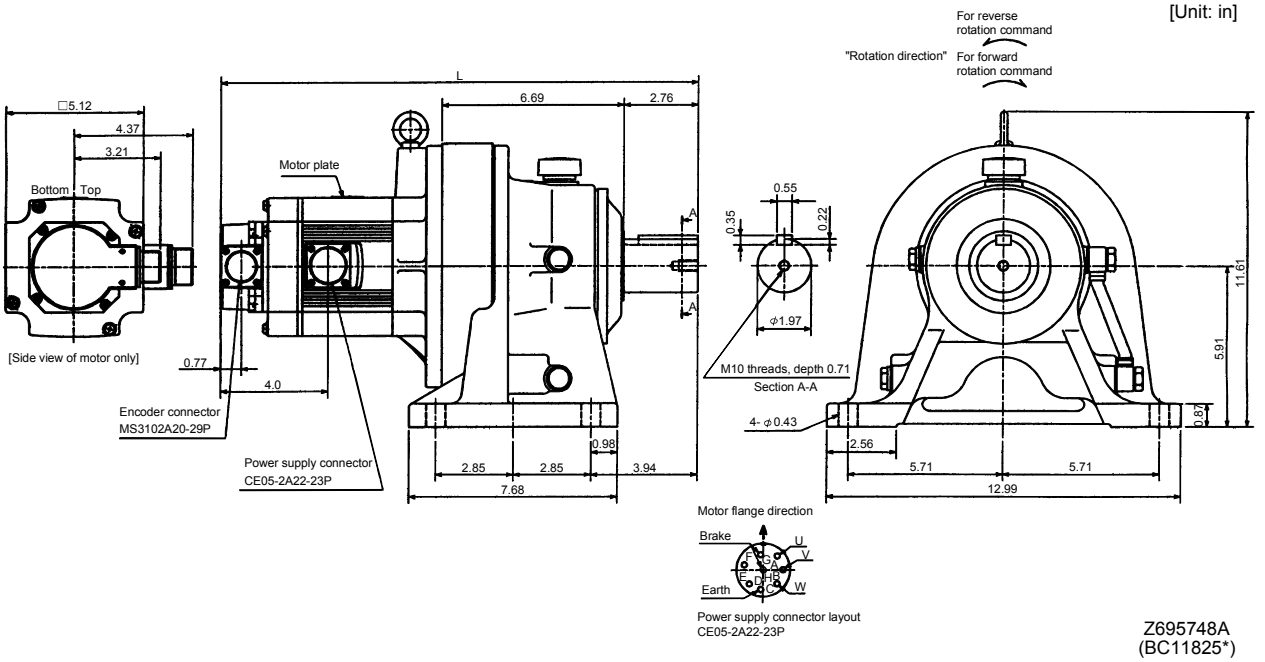
[Unit: in]



Z695749A
(BC11826*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz · in]
HC-SF102BG1H	HC-SFS102BG1H HC-SFS1024BG1H	1.0	1/43	94.86	17.68	116.8	1175
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/29	130.02	18.66	121.3	1175
HC-SF152BG1H	HC-SFS152BG1H HC-SFS1524BG1H	1.5	1/35	129.74	18.66	121.3	1175

[Unit: in]

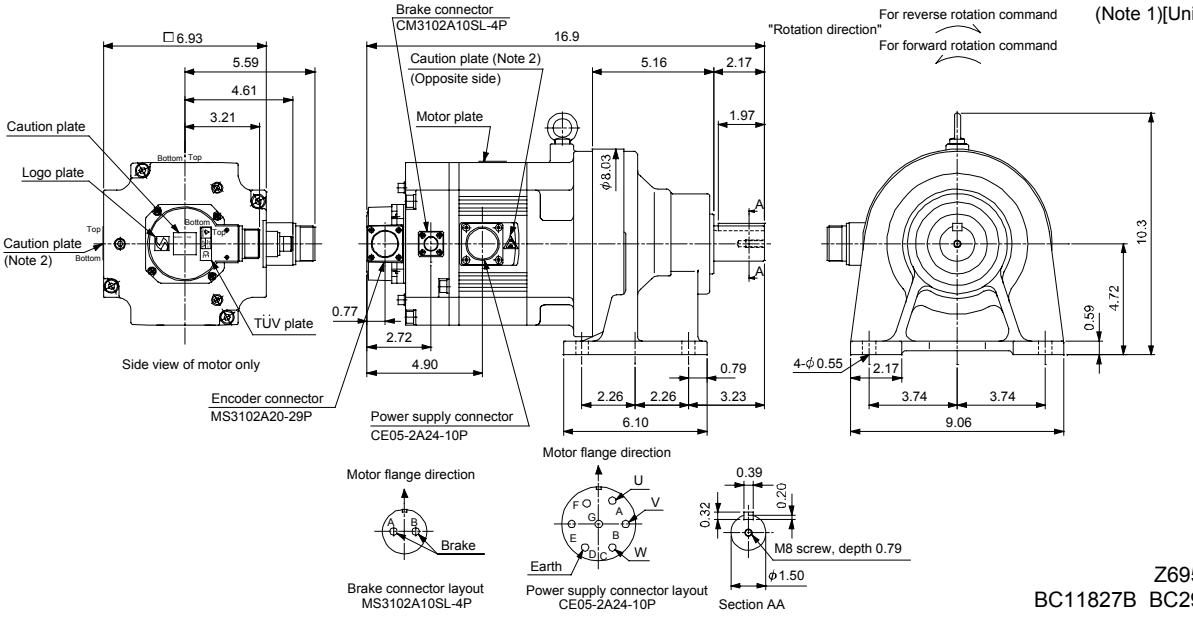


Z695748A
(BC11825*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]	Brake static friction torque [oz · in]
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/6	303.99	90.4	6103
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/11	295.79	90.4	6103
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/17	293.60	90.4	6103

(Note 1)[Unit: in]

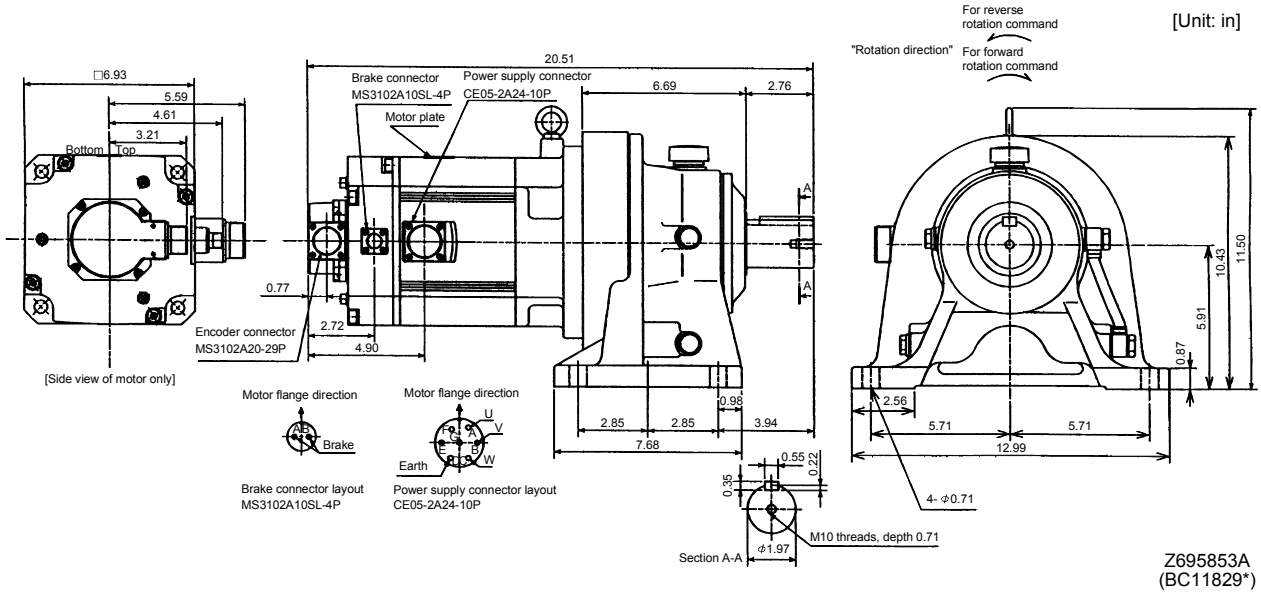


Z695852A
BC11827B BC29626A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]	Brake static friction torque [oz · in]
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/6	547.29	145.5	6103
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/11	525.97	145.5	6103
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/17	519.41	145.5	6103

[Unit: in]

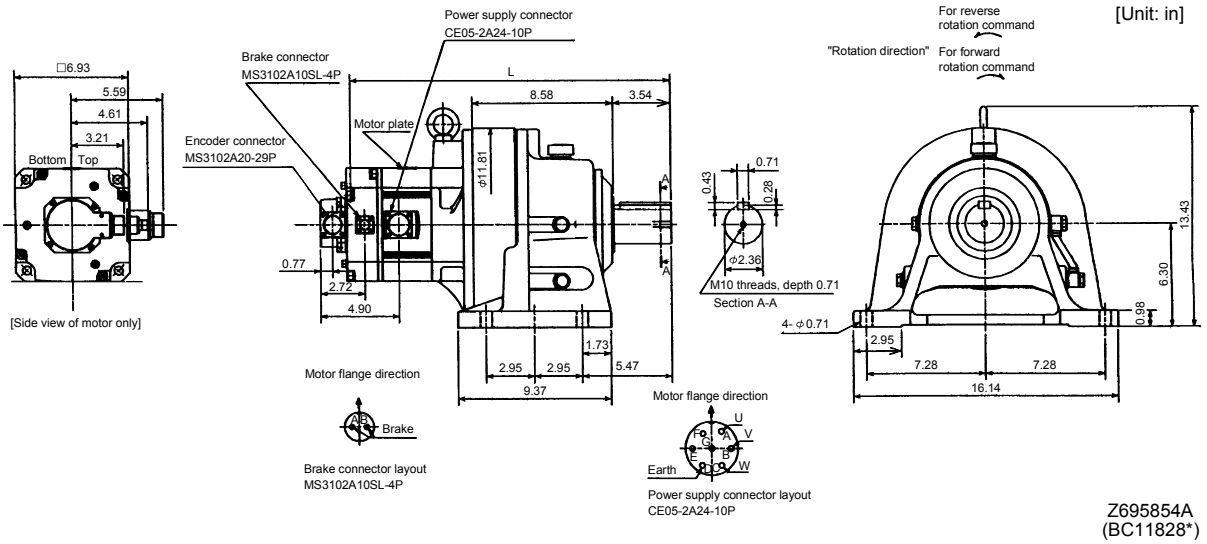


Z695853A
(BC11829*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/29	322.03	21.50	213.8	6103
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/35	320.39	21.50	213.8	6103
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/43	319.30	21.50	213.8	6103
HC-SF202BG1H	HC-SFS202BG1H HC-SFS2024BG1H	2.0	1/59	318.75	21.50	213.8	6103
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/29	538.8	23.15	229.3	6103
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/35	536.36	23.15	229.3	6103

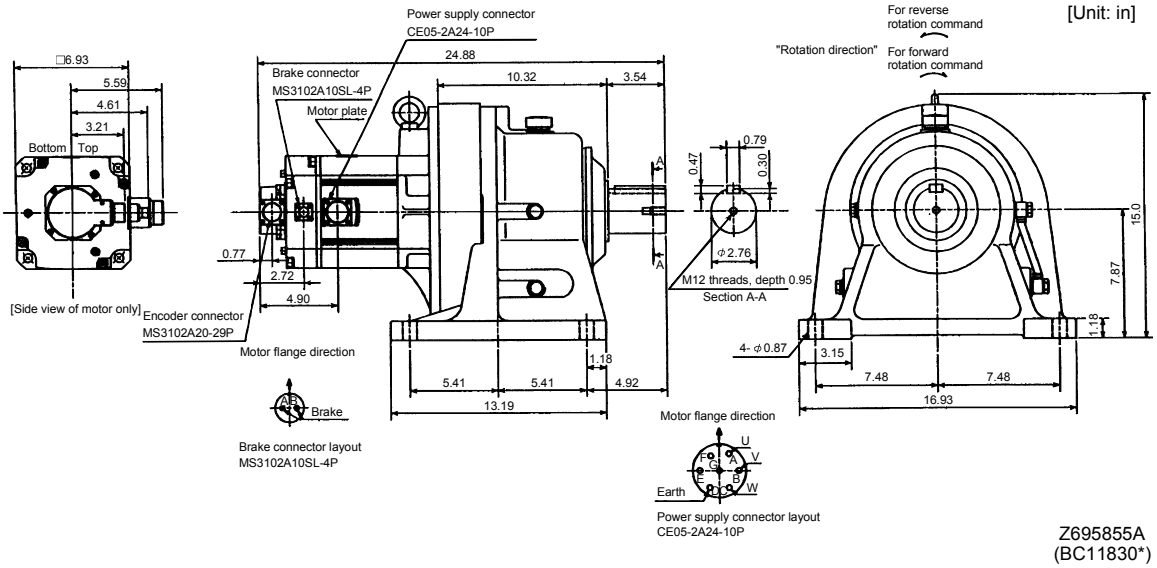
[Unit: in]



Z695854A
(BC11828*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/43	636.96	319.7	6103
HC-SF352BG1H	HC-SFS352BG1H HC-SFS3524BG1H	3.5	1/59	633.68	319.7	6103

[Unit: in]

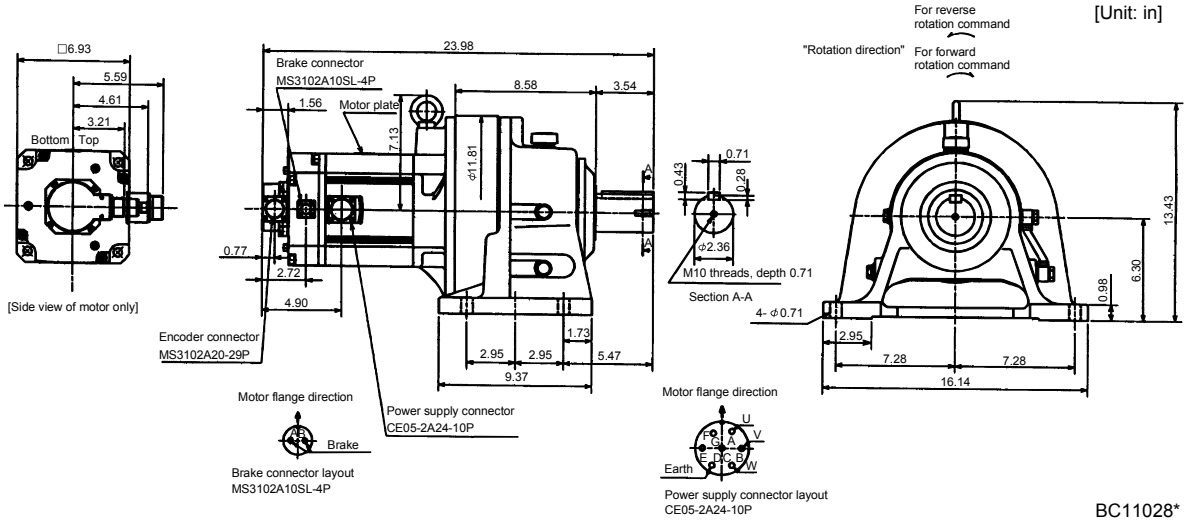


Z695855A
(BC11830*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/11	674.68	238.1	6103
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/17	652.81	238.1	6103

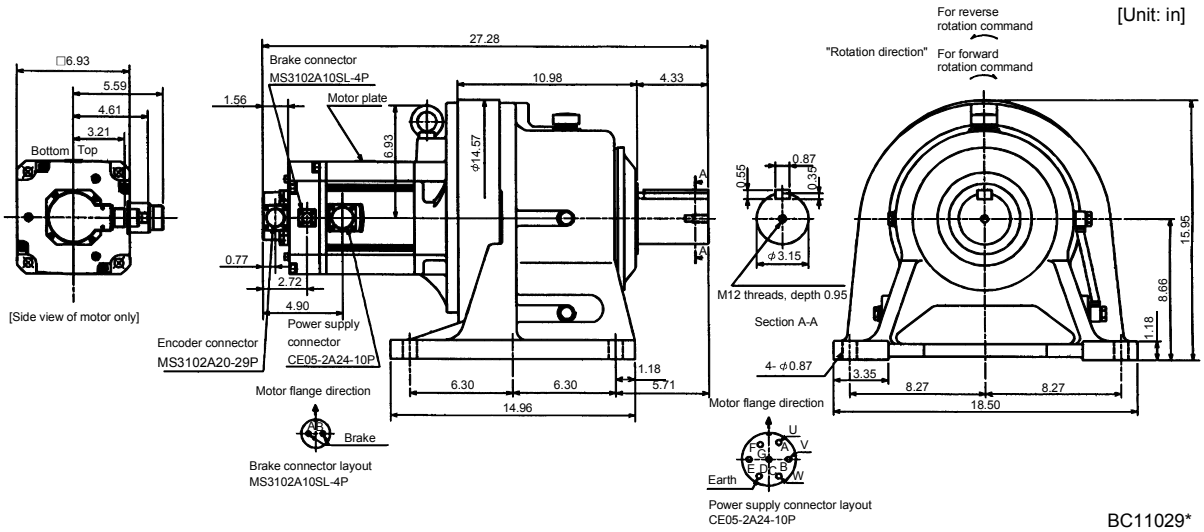
[Unit: in]



BC11028*
(BC11831*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/29	811.92	390.2	6103
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/35	809.18	390.2	6103
HC-SF502BG1H	HC-SFS502BG1H HC-SFS5024BG1H	5.0	1/43	803.71	390.2	6103

[Unit: in]

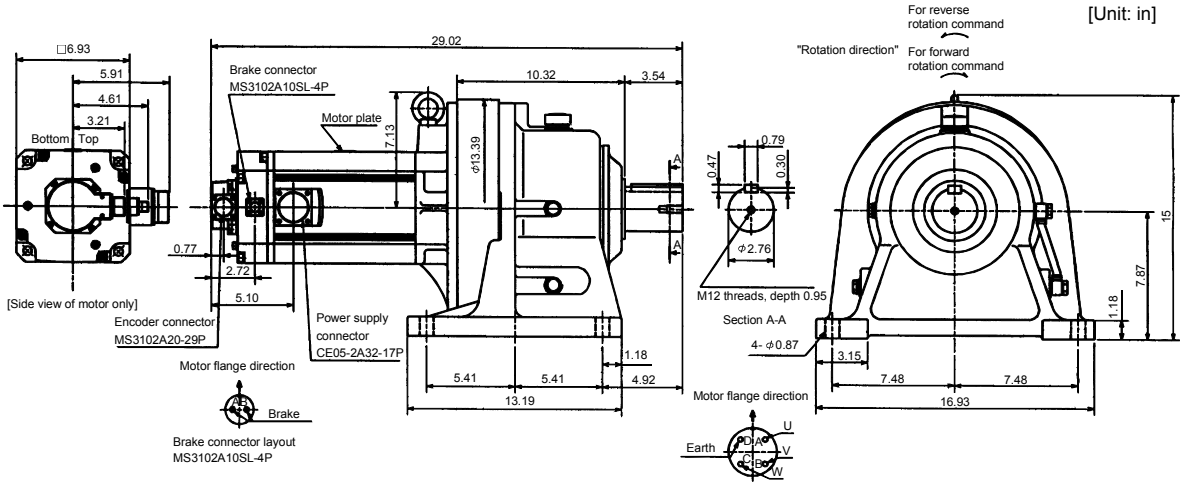


BC11029*
(BC11832*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/11	1141.60	317.5	6103
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/17	1093.49	317.5	6103

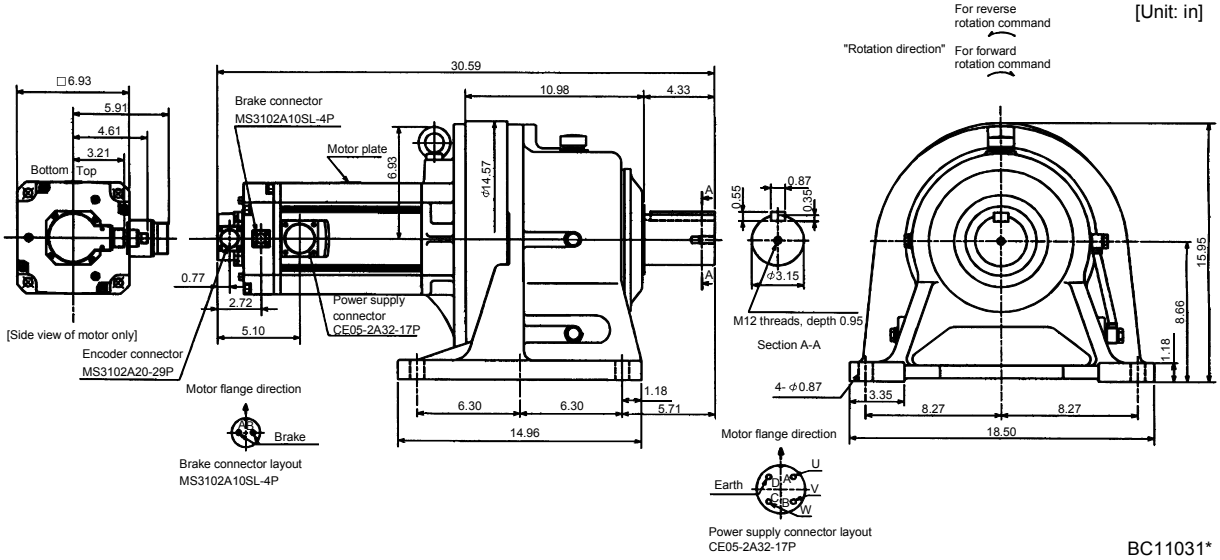
[Unit: in]



BC11030*
(BC11833*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/29	1134.50	410.1	6103
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/35	1131.76	410.1	6103

[Unit: in]

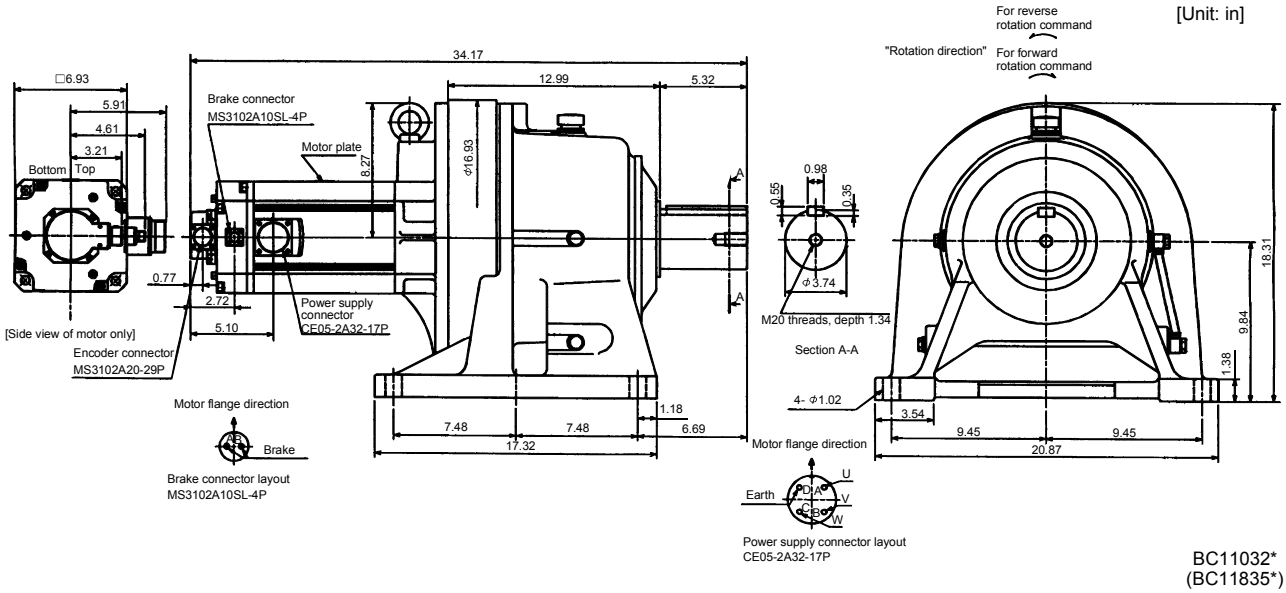


BC11031*
(BC11834*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]	Brake static friction torque [oz · in]
HC-SF702BG1H	HC-SFS702BG1H HC-SFS7024BG1H	7.0	1/43	1458.71	588.6	6103

[Unit: in]



BC11032*
(BC11835*)

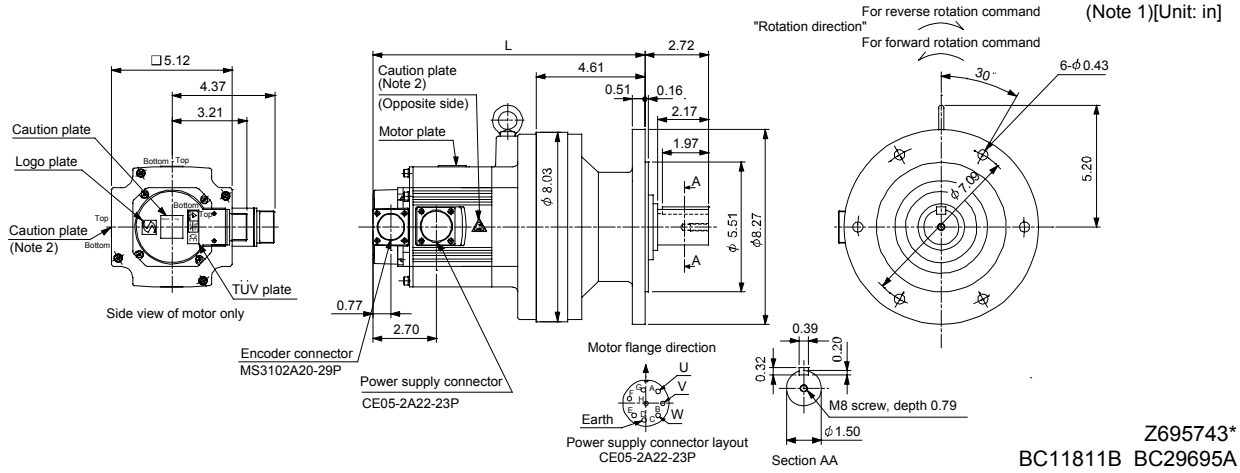
(4) With reduction gear for general industrial machine (flange type)

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/35	41.01	10.59	59.5
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/43	40.73	10.59	59.5
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/59	40.60	10.59	59.5
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/6	91.85	11.58	63.9
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/11	83.7	11.58	63.9
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/17	81.47	11.58	63.9
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/29	79.83	11.58	63.9
HC-SF102G1	HC-SFS102G1	HC-SFS1024G1	1.0	1/35	79.8	11.58	63.9
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/6	126.3	12.56	68.3
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/11	117.55	12.56	68.3
HC-SF152G1	HC-SFS152G1	HC-SFS1524G1	1.5	1/17	115.9	12.56	68.3

(Note 1)[Unit: in]

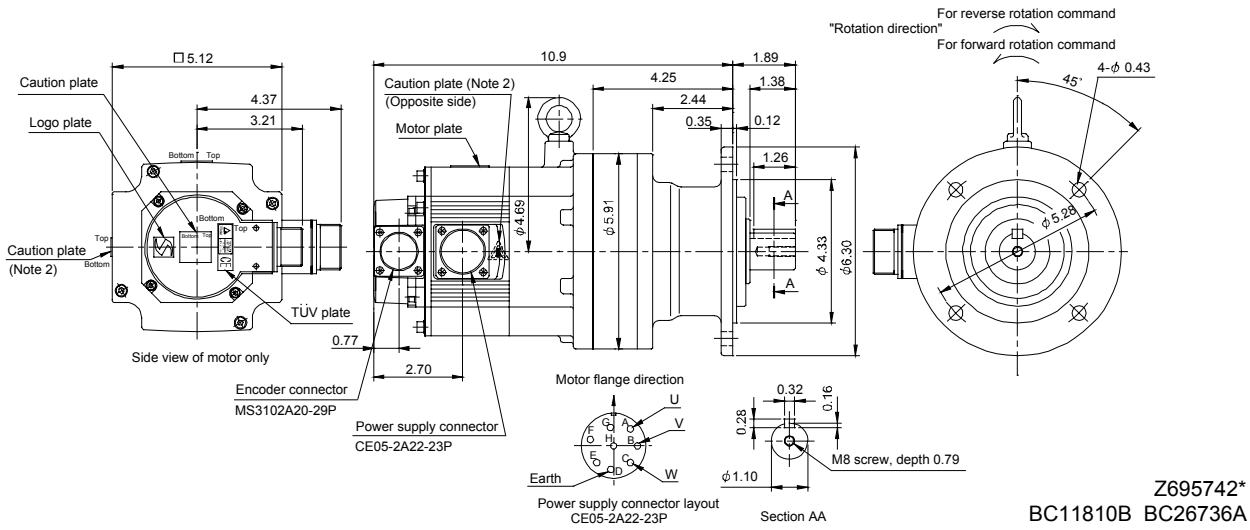


Z695743*
BC11811B BC29695A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/6	40.05	40.8
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/11	38.00	40.8
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/17	37.45	40.8
HC-SF52G1	HC-SFS52G1	HC-SFS524G1	0.5	1/29	37.04	40.8

(Note 1)[Unit: in]



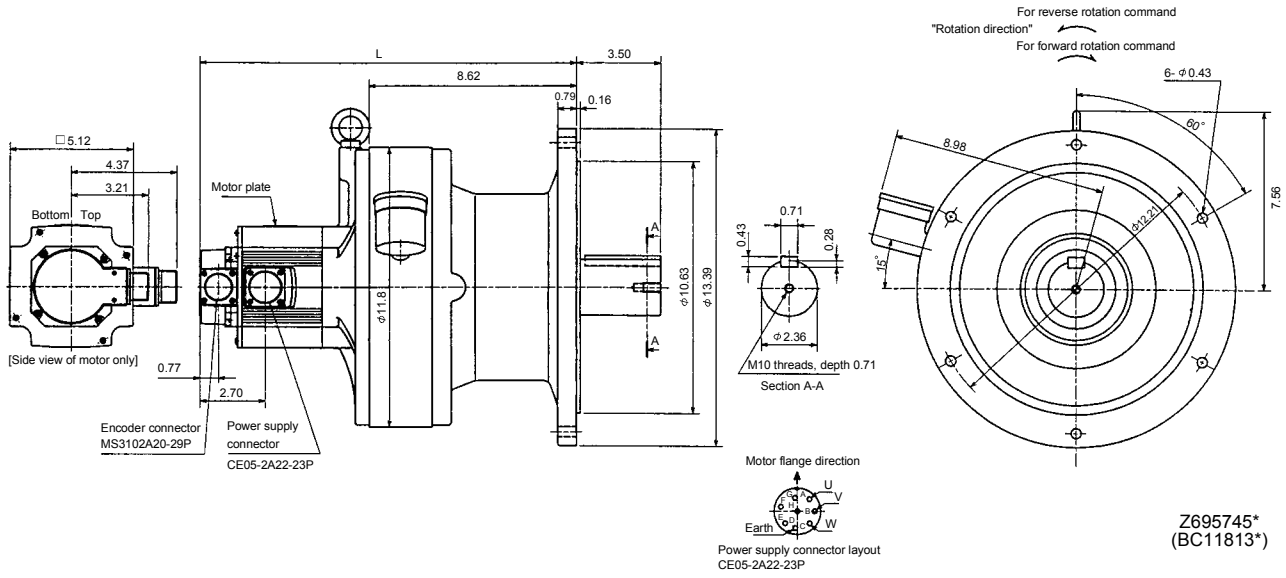
Z695742*
BC11810B BC26736A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF102G1	HC-SFS102G1 HC-SFS1024G1	1.0	1/59	106.48	13.35	183.0
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/43	141.06	16.69	187.4
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/59	140.65	16.69	187.4

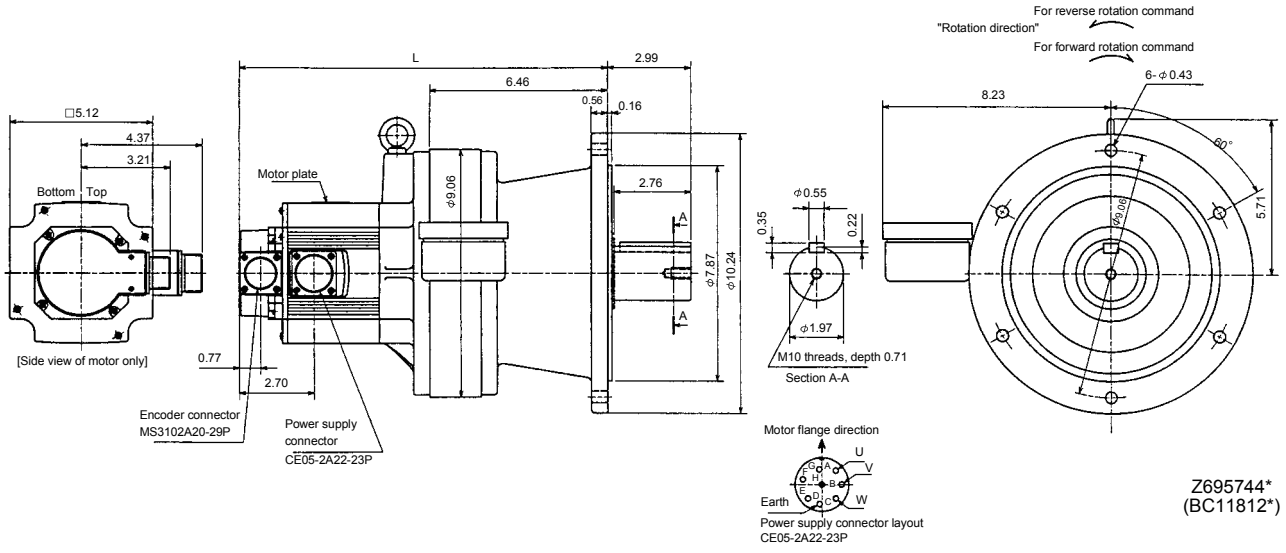
[Unit: in]



Z695745*
(BC11813*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF102G1	HC-SFS102G1 HC-SFS1024G1	1.0	1/43	85.57	13.39	105.8
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/29	120.69	14.37	110.2
HC-SF152G1	HC-SFS152G1 HC-SFS1524G1	1.5	1/35	120.42	14.37	110.2

[Unit: in]

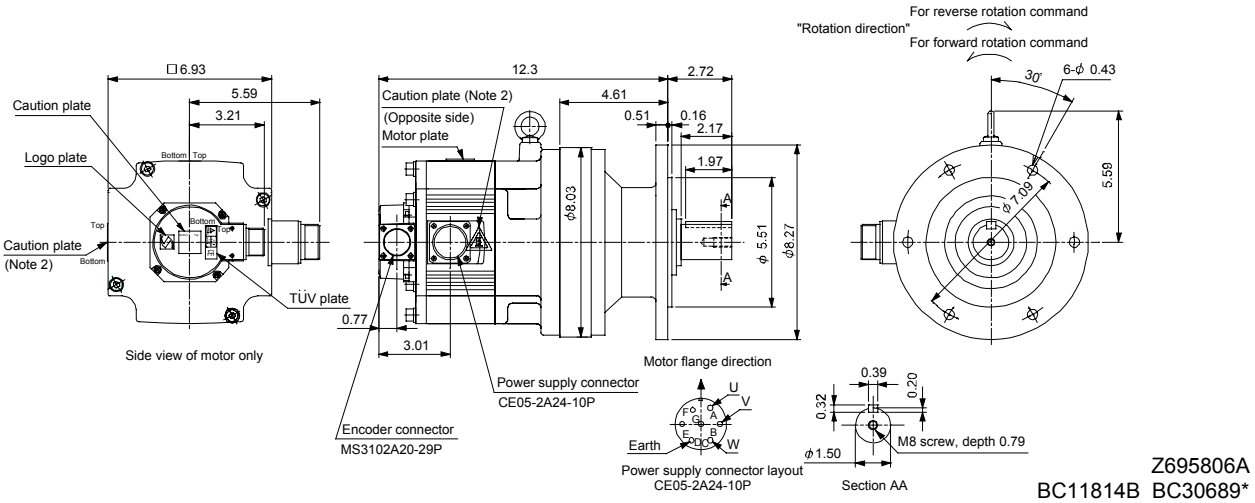


Z695744*
(BC11812*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/6	249.32	75.0
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/11	241.11	75.0
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/17	238.93	75.0

(Note 1)[Unit: in]

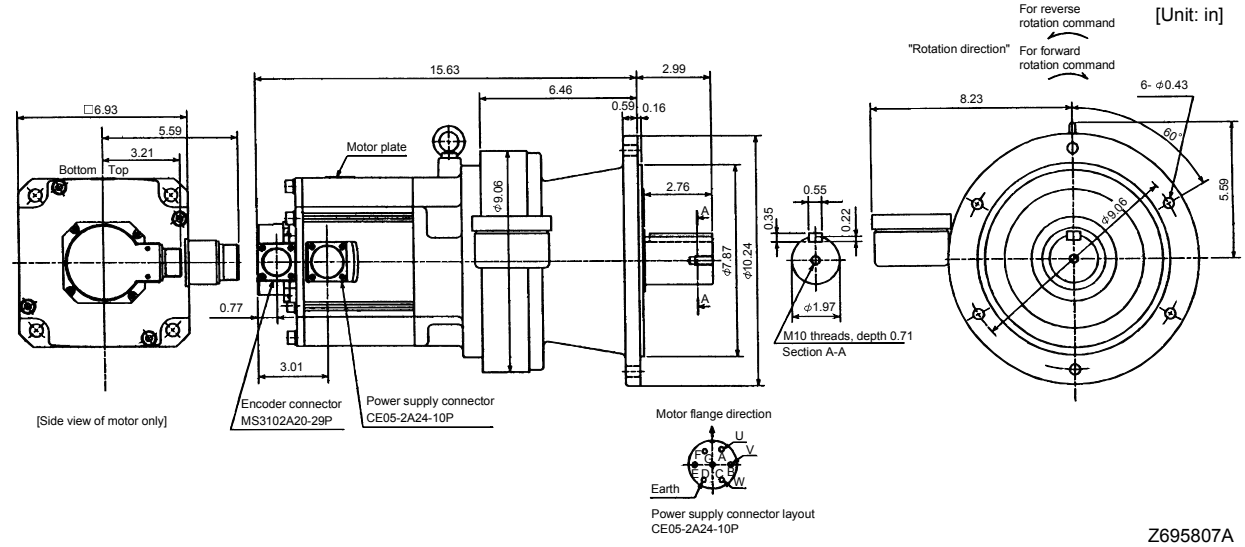


Z695806A
BC11814B BC30689*

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/6	492.62	125.7
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/11	471.29	125.7
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/17	464.73	125.7

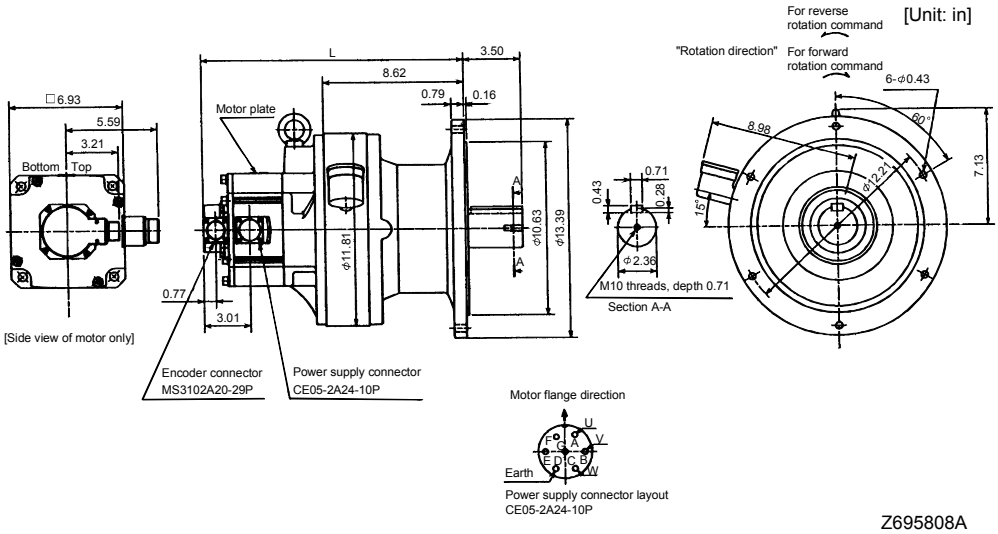
[Unit: in]



Z695807A
(BC11816*)

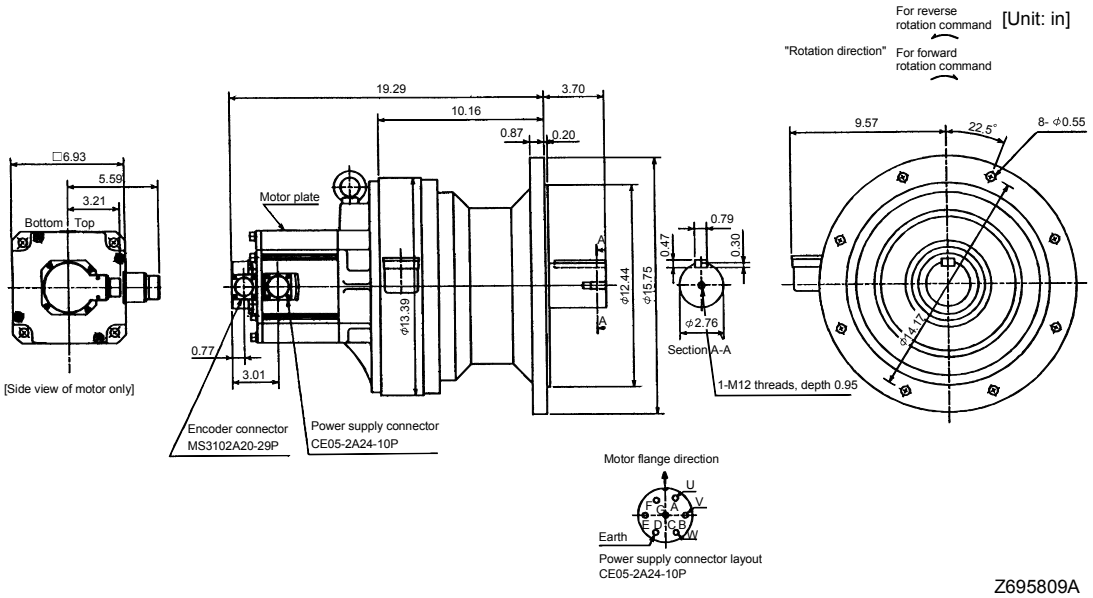
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in] L	Mass [lb]
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/29	267.36	16.10	185.2
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/35	265.72	16.10	185.2
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/43	264.62	16.10	185.2
HC-SF202G1	HC-SFS202G1 HC-SFS2024G1	2.0	1/59	264.08	16.10	185.2
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/29	483.32	17.76	200.6
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/35	481.68	17.76	200.6



Z695808A
(BC11815*)

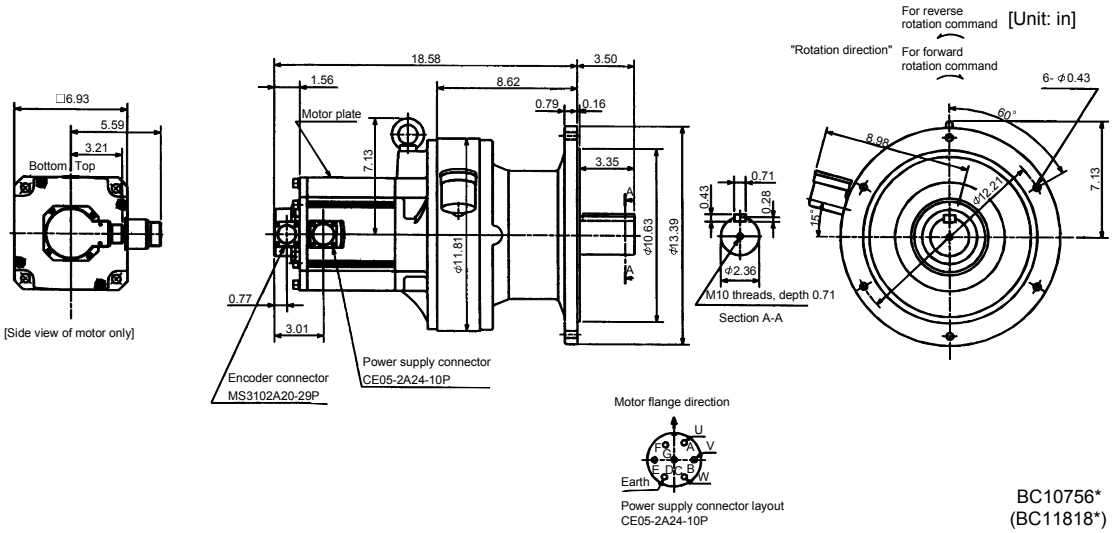
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/43	582.28	293.2
HC-SF352G1	HC-SFS352G1 HC-SFS3524G1	3.5	1/59	579.0	293.2



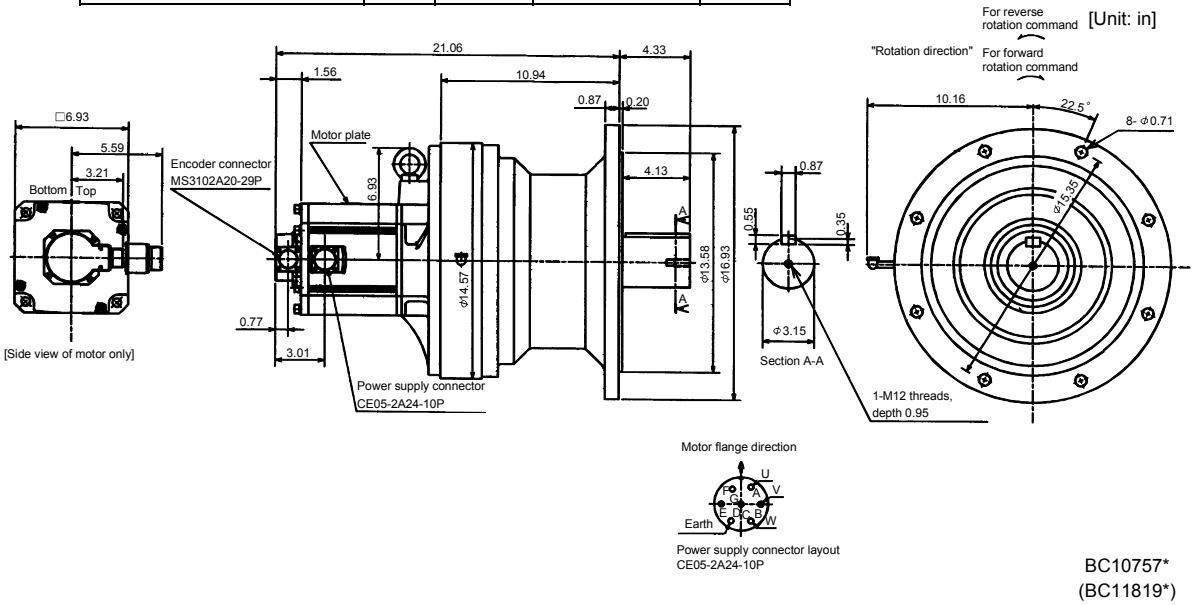
Z695809A
(BC11817*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/11	620.01	209.4
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/17	598.14	209.4

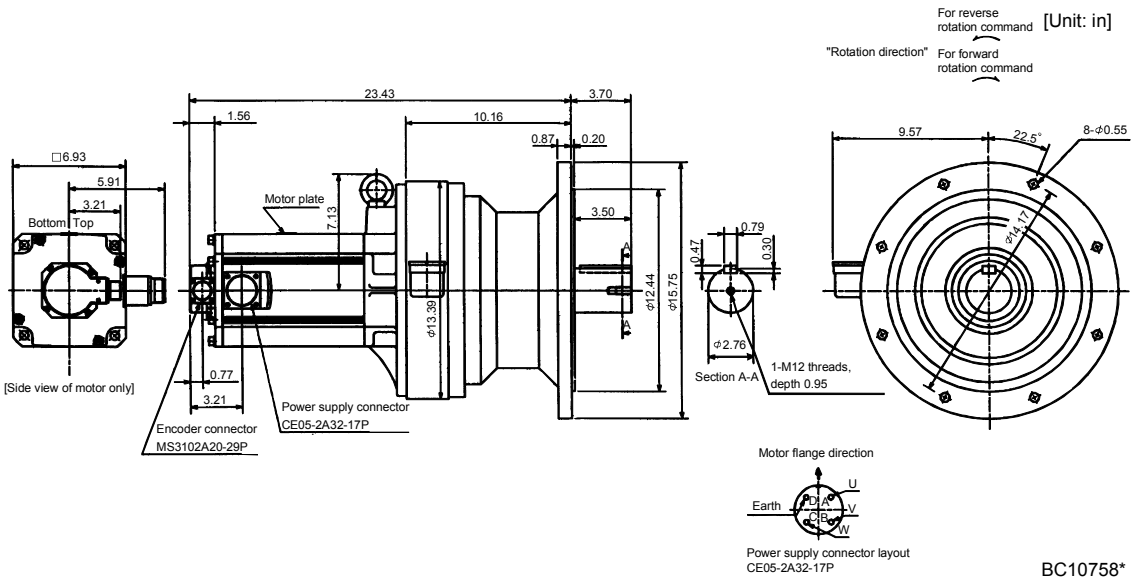


Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/29	757.24	357.1
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/35	754.51	357.1
HC-SF502G1	HC-SFS502G1 HC-SFS5024G1	5.0	1/43	749.04	357.1



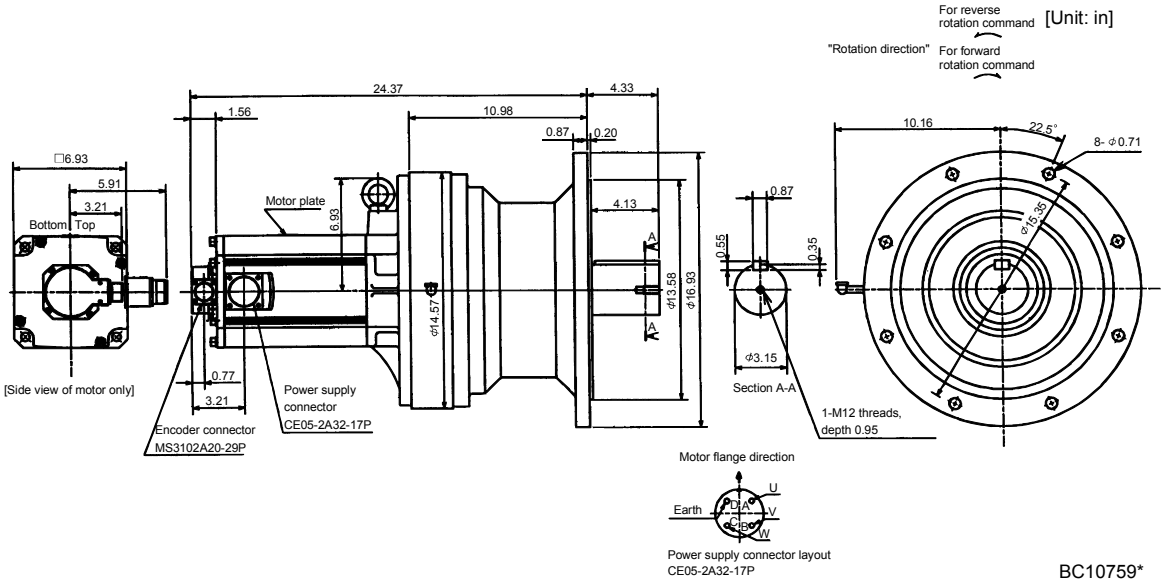
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/11	1086.93	321.9
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/17	1038.82	321.9



BC10758*
(BC11820*)

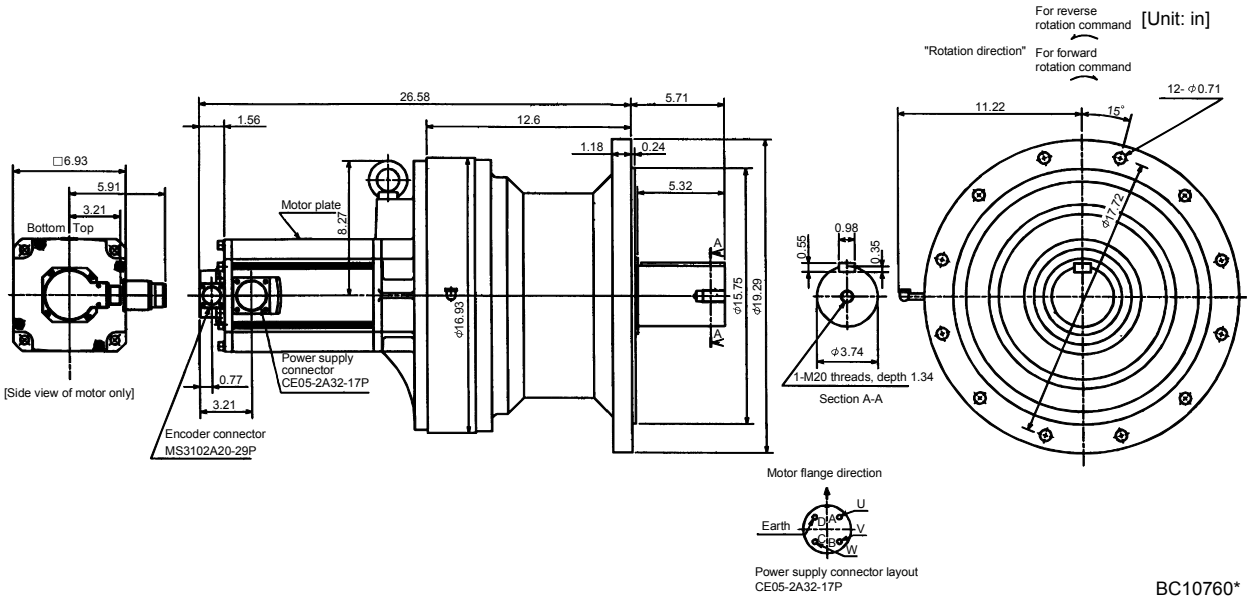
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2])	Mass [lb]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/29	1079.82	377.0
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/35	1077.09	377.0



BC10759*
(BC11821*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-SF702G1	HC-SFS702G1 HC-SFS7024G1	7.0	1/43	1404.04	529.1

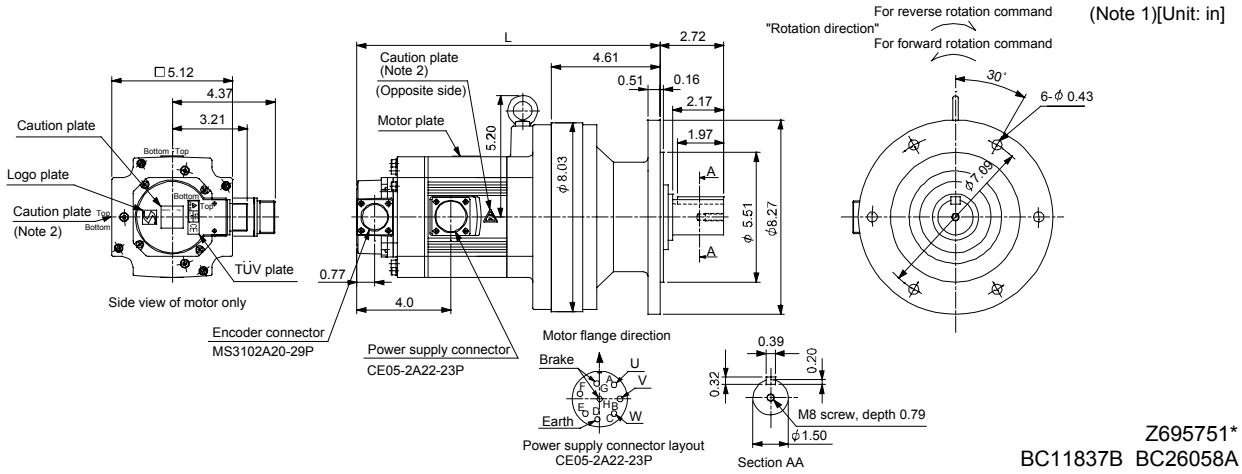


BC10760*
(BC11822*)

(b) With electromagnetic brake

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz・in]
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/35	50.3	11.89	71.7	1175
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/43	50.03	11.89	71.7	1175
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/59	49.89	11.89	71.7	1175
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/6	101.15	12.87	76.1	1175
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/11	92.9	12.87	76.1	1175
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/17	90.76	12.87	76.1	1175
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/29	89.12	12.87	76.1	1175
HC-SF102BG1	HC-SFS102BG1	HC-SFS1024BG1	1.0	1/35	89.1	12.87	76.1	1175
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/6	135.6	13.86	80.5	1175
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/11	126.85	13.86	80.5	1175
HC-SF152BG1	HC-SFS152BG1	HC-SFS1524BG1	1.5	1/17	125.2	13.86	80.5	1175

(Note 1)[Unit: in]

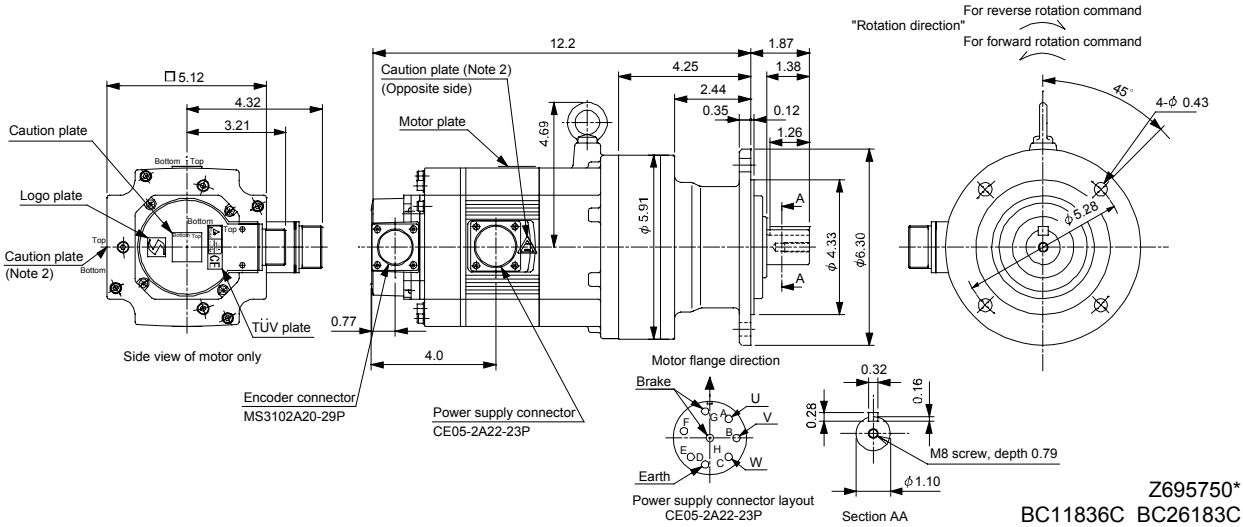


Z695751*
BC11837B BC26058A

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

Model			Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [oz・in]
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/6	49.34	45.2	1175
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/11	47.29	45.2	1175
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/17	46.75	45.2	1175
HC-SF52BG1	HC-SFS52BG1	HC-SFS524BG1	0.5	1/29	46.34	45.2	1175

(Note 1)[Unit: in]



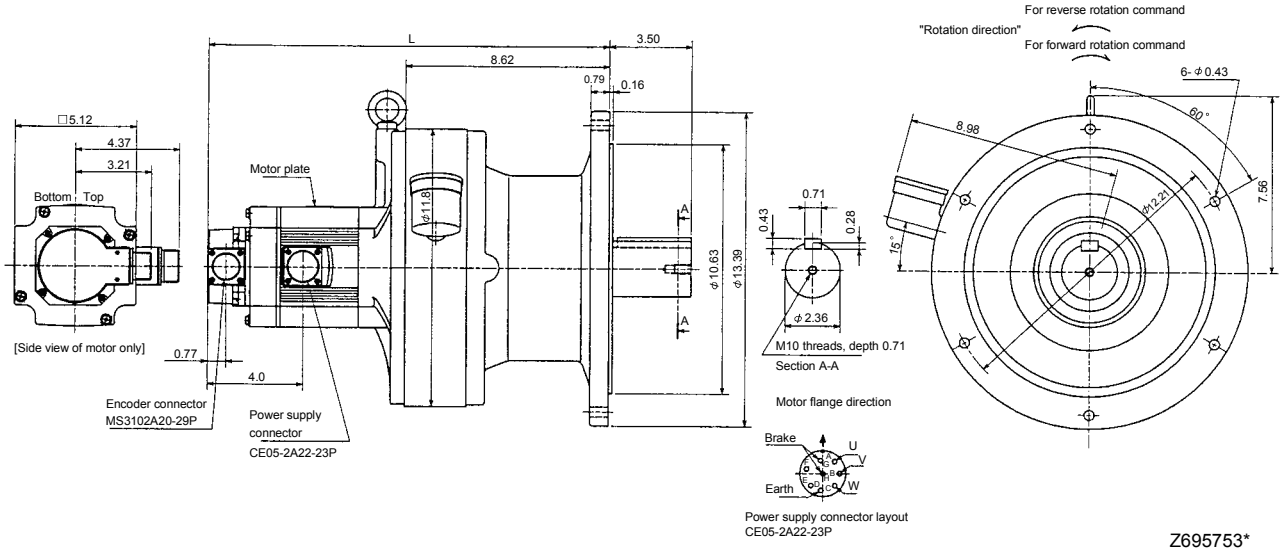
Z695750*
BC11836C BC26183C

Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz • in]
HC-SF102BG1	HC-SFS102BG1 HC-SFS1024BG1	1.0	1/59	115.77	17.01	187.4	1175
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/43	150.36	17.99	191.8	1175
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/59	149.95	17.99	191.8	1175

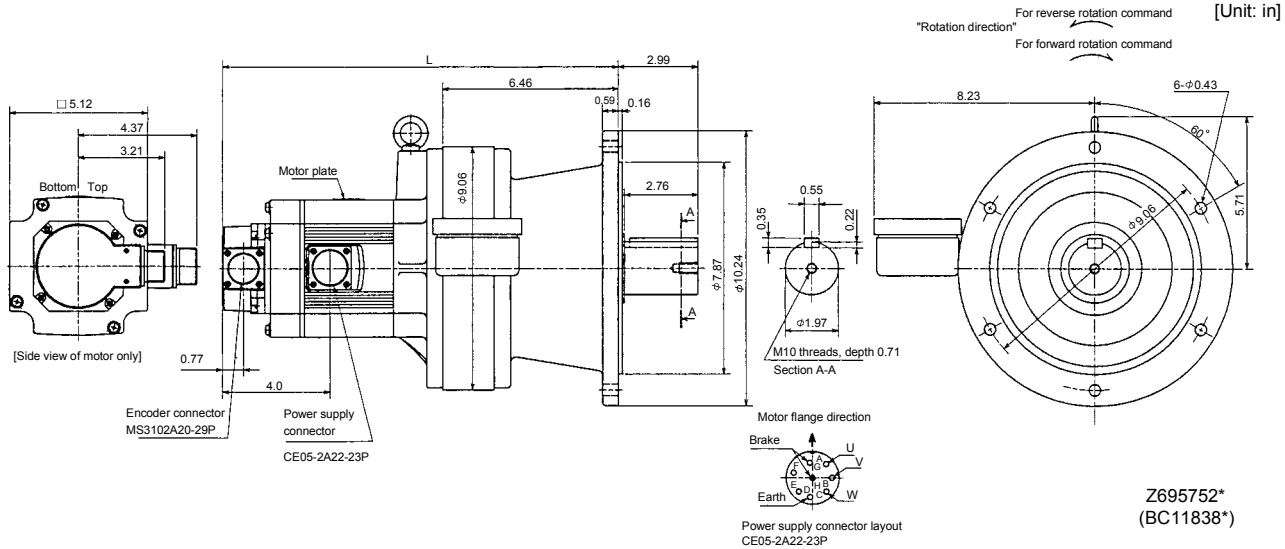
[Unit: in]



Z695753*
(BC11839*)

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz • in]
HC-SF102BG1	HC-SFS102BG1 HC-SFS1024BG1	1.0	1/43	94.86	14.69	110.2	1175
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/29	129.99	15.67	114.6	1175
HC-SF152BG1	HC-SFS152BG1 HC-SFS1524BG1	1.5	1/35	129.72	15.67	114.6	1175

[Unit: in]

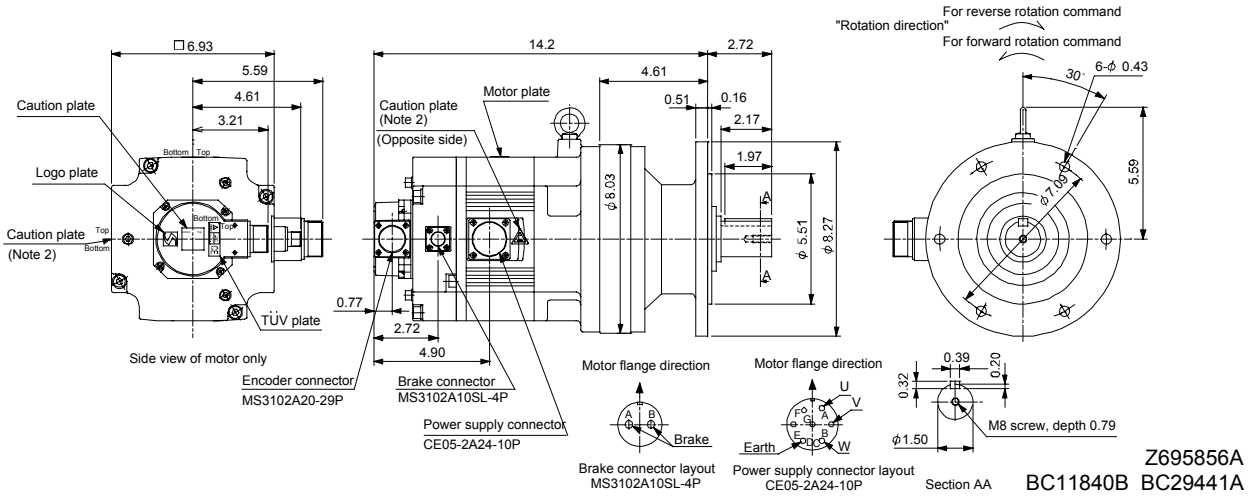


Z695752*
(BC11838*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]	Brake static friction torque [oz · in]
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/6	303.99	88.2	6103
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/11	295.79	88.2	6103
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/17	293.60	88.2	6103

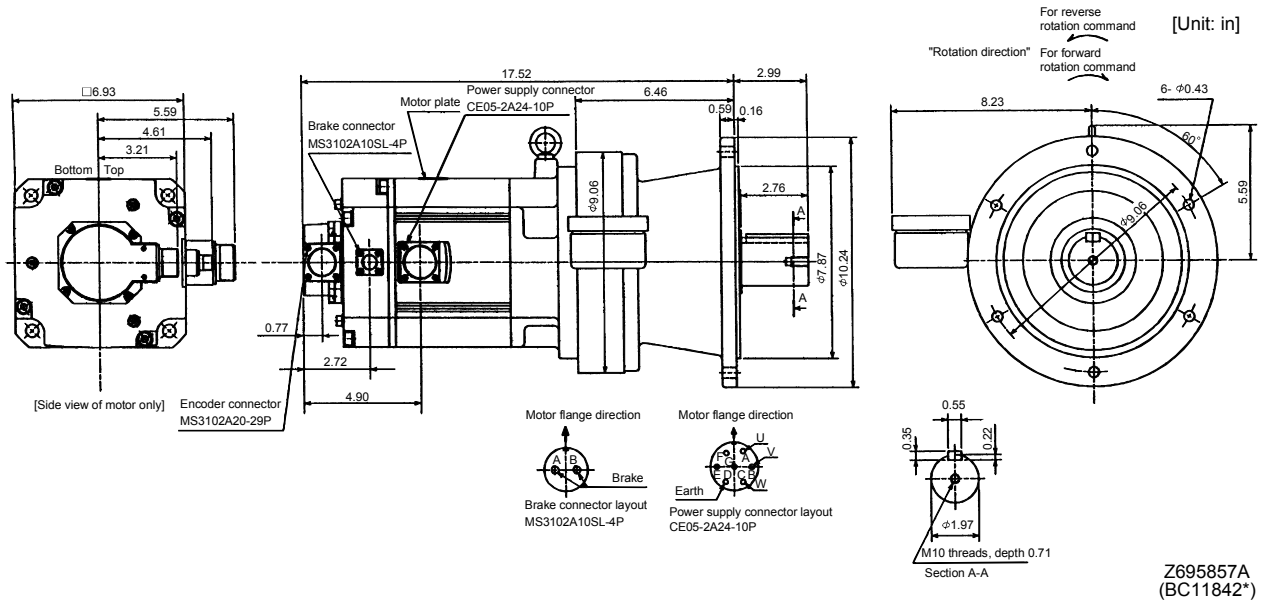
(Note 1)[Unit: in]



Note 1. The dimensions without tolerances are reference dimensions.
2. This caution plate is attached to the 400V class motors only, not to the 200V class.

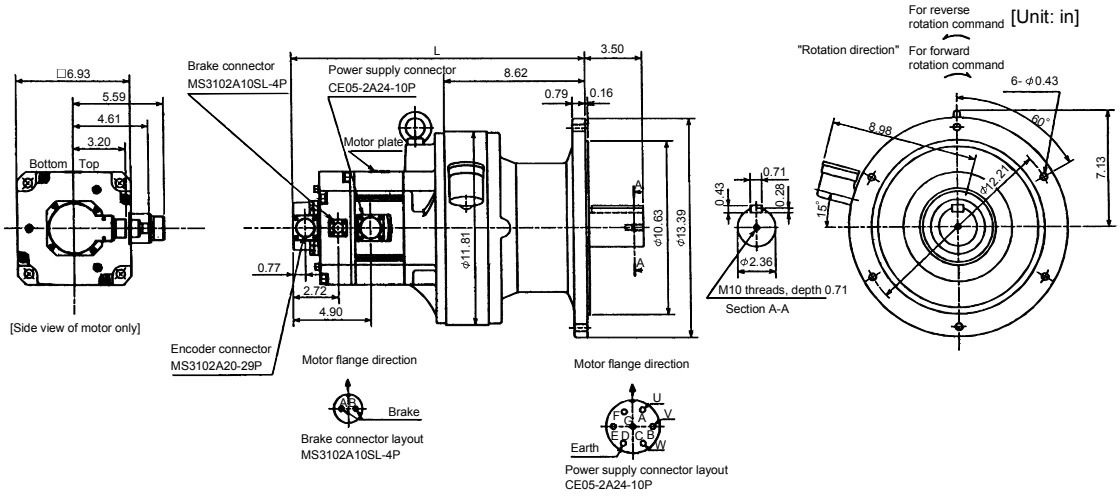
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Mass [lb]	Brake static friction torque [oz · in]
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/6	547.29	138.9	6103
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/11	525.97	138.9	6103
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/17	519.41	138.9	6103

[Unit: in]



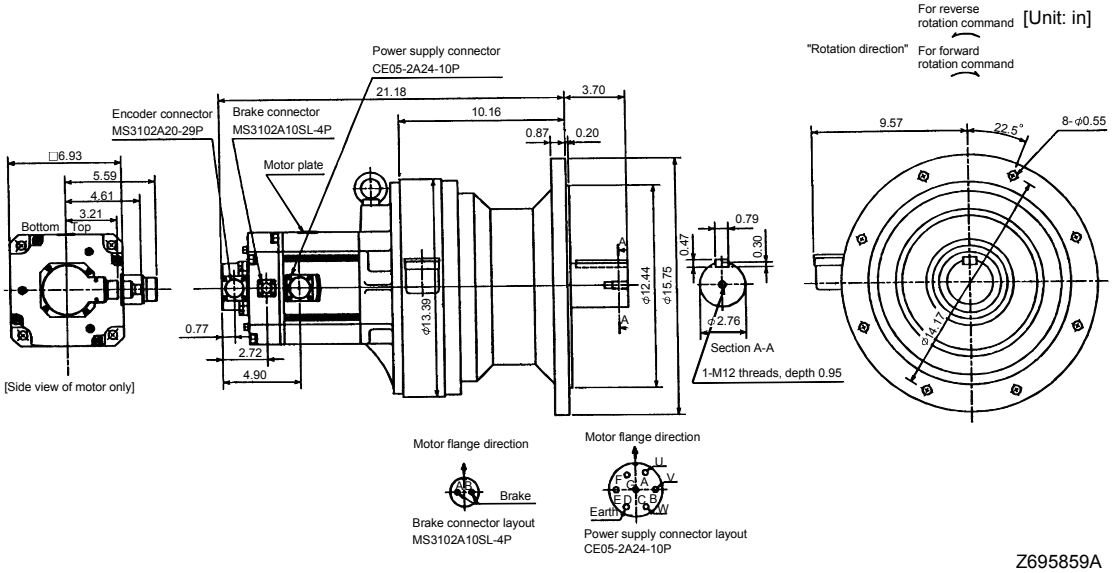
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Variable Dimensions [in] L	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/29	322.03	17.99	198.4	6103
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/35	320.39	17.99	198.4	6103
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/43	319.30	17.99	198.4	6103
HC-SF202BG1	HC-SFS202BG1 HC-SFS2024BG1	2.0	1/59	318.75	17.99	198.4	6103
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/29	538.0	19.65	213.8	6103
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/35	536.36	19.65	213.8	6103



Z695858A
(BC11841*)

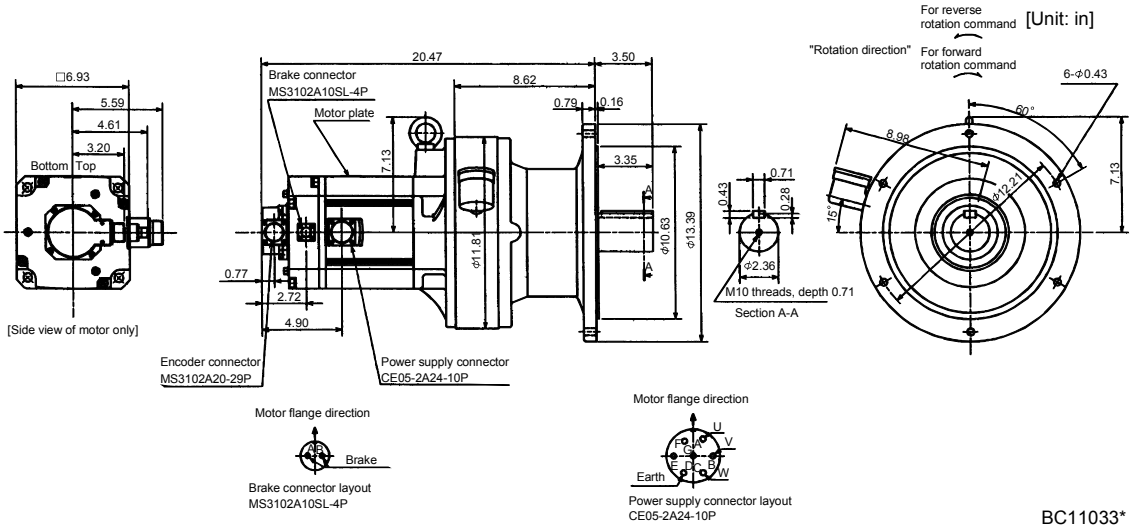
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/43	636.96	306.4	6103
HC-SF352BG1	HC-SFS352BG1 HC-SFS3524BG1	3.5	1/59	633.68	306.4	6103



Z695859A
(BC11843*)

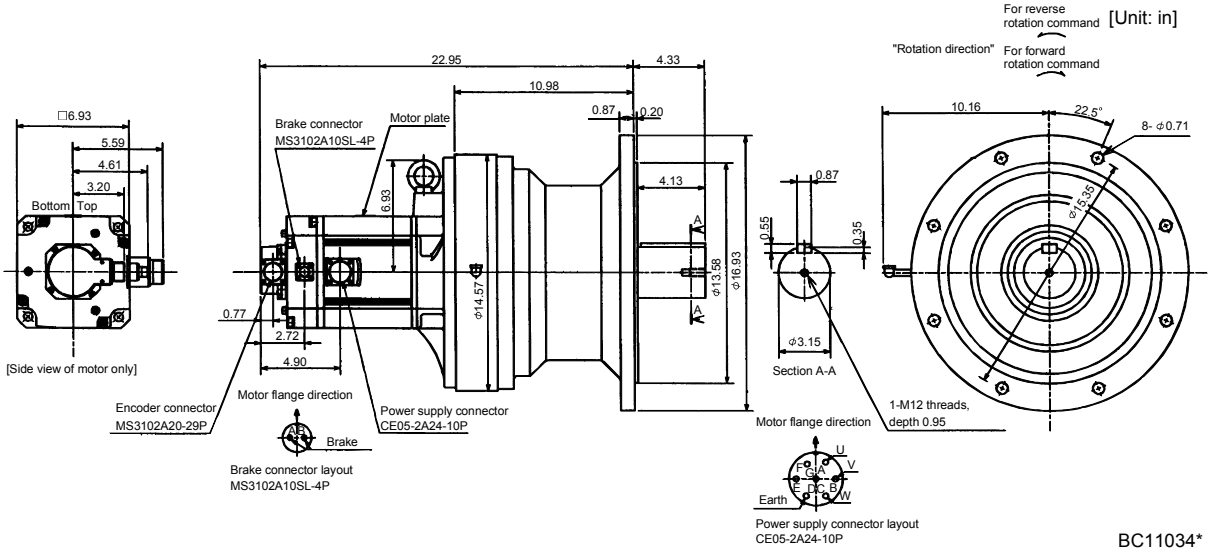
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/11	674.68	222.7	6103
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/17	652.81	222.7	6103



BC11033*
(BC11844*)

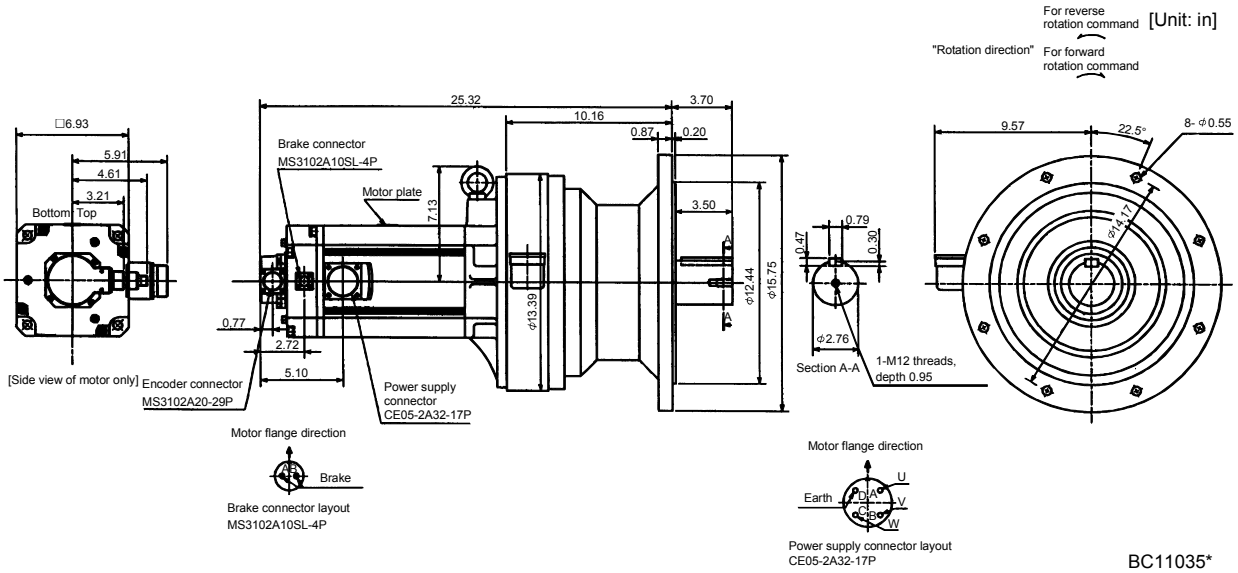
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/29	811.92	370.4	6103
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/35	809.18	370.4	6103
HC-SF502BG1	HC-SFS502BG1 HC-SFS5024BG1	5.0	1/43	803.71	370.4	6103



BC11034*
(BC11845*)

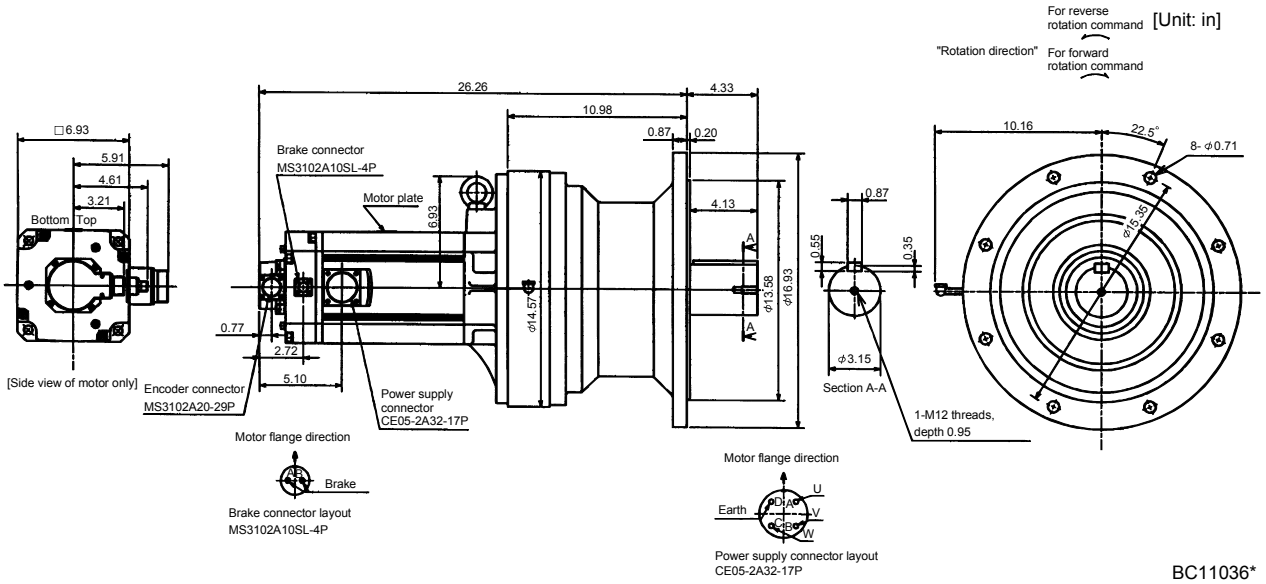
7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/11	1141.60	335.1	6103
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/17	1093.49	335.1	6103



BC11035*
(BC11846*)

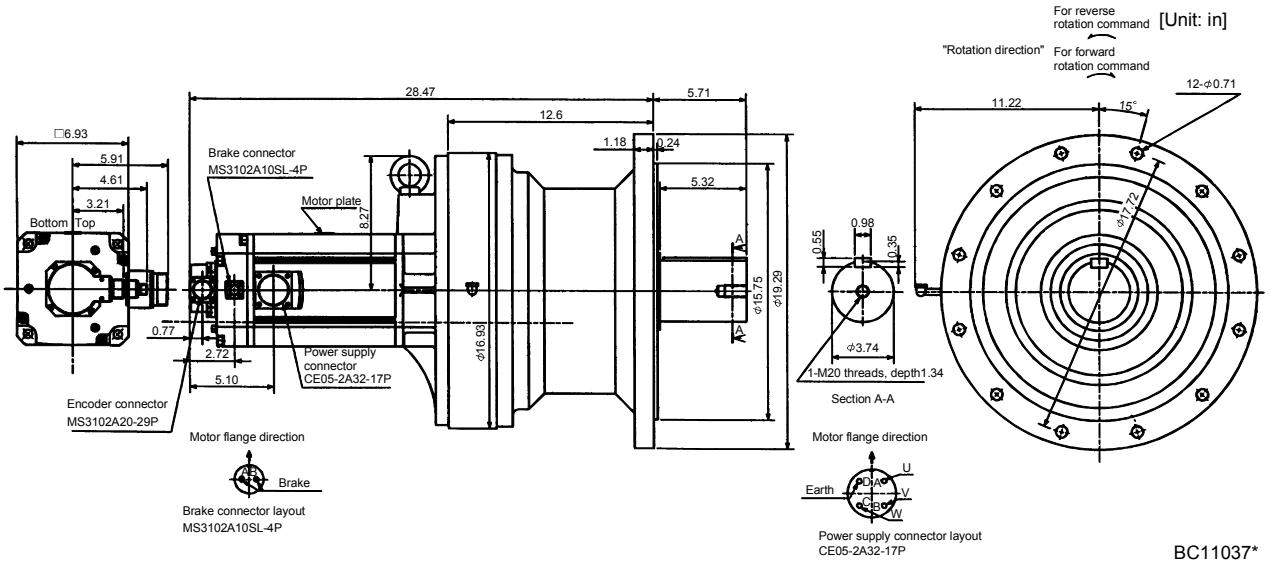
Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/29	1134.50	390.2	6103
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/35	1131.76	390.2	6103



BC11036*
(BC11847*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG1	HC-SFS702BG1 HC-SFS7024BG1	7.0	1/43	1458.71	542.3	6103



BC11037*
(BC11848*)

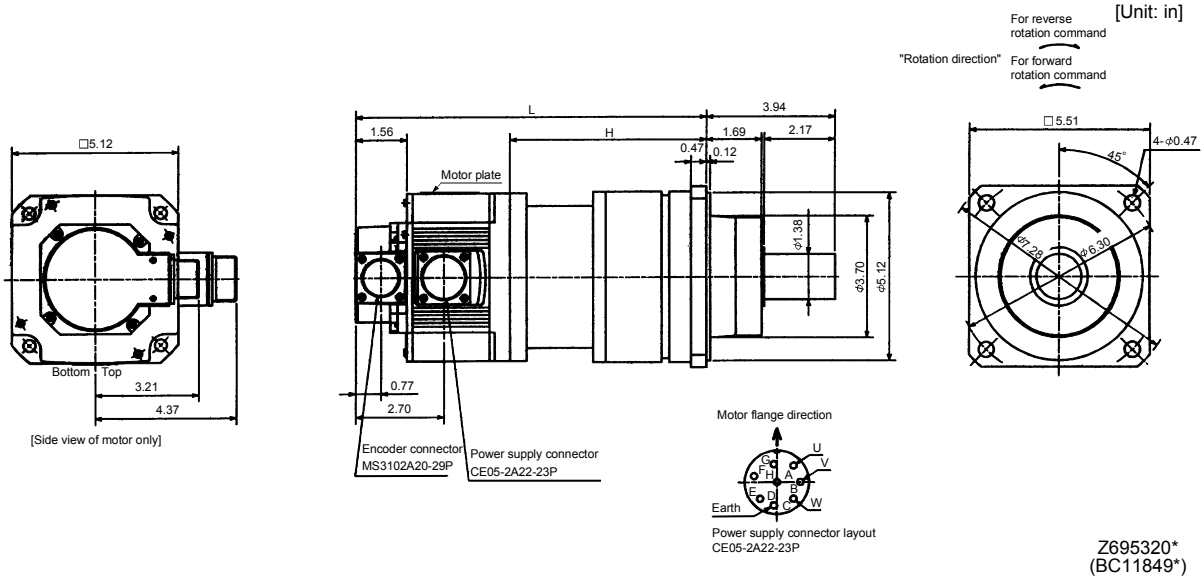
(5) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Mass [lb]
							L	H	
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-05B-05MEH	1/5	43.19	10.87	6.14	28.7
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-09B-05MEH	1/9	41.28	11.34	6.61	28.7
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL2-20B-05MEH	1/20	43.88	12.17	7.44	33.1
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL2-05B-10MEH	1/5	81.88	11.85	6.14	33.1
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL2-09B-10MEH	1/9	79.96	12.32	6.61	33.1
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL2-05B-15MEH	1/5	116.05	12.84	6.14	37.5

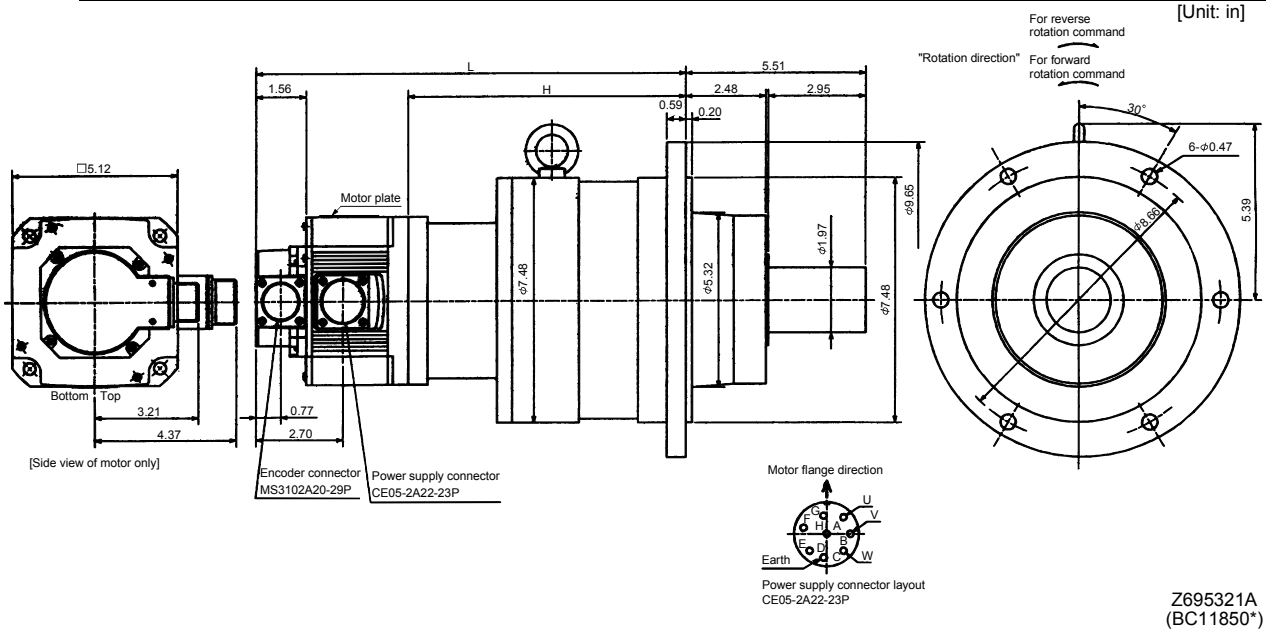
[Unit: in]



Z695320*
(BC11849*)

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Mass [lb]
							L	H	
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL3-29B-05MEH	1/29	51.39	13.27	8.54	66.1
HC-SF52G2	HC-SFS52G2	HC-SFS524G2	0.5	BL3-45B-05MEH	1/45	46.06	13.50	8.78	66.1
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL3-20B-10MEH	1/20	100.46	14.25	8.54	70.5
HC-SF102G2	HC-SFS102G2	HC-SFS1024G2	1.0	BL3-29B-10MEH	1/29	90.08	14.25	8.54	70.5
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL3-09B-15MEH	1/9	134.77	14.92	8.23	75.0
HC-SF152G2	HC-SFS152G2	HC-SFS1524G2	1.5	BL3-20B-15MEH	1/20	134.64	15.24	8.54	75.0

[Unit: in]

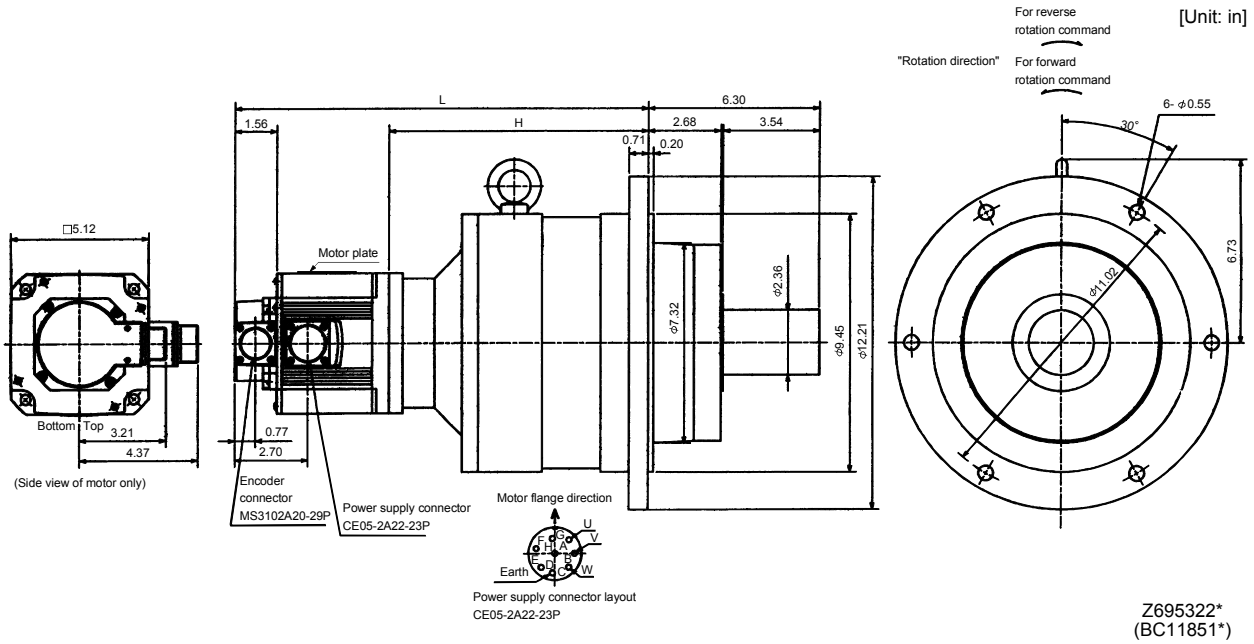


Z695321A
(BC11850*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in]		Mass [lb]
						L	H	
HC-SF102G2	HC-SFS102G2 HC-SFS1024G2	1.0	BL4-45B-10MEH	1/45	110.85	15.32	9.61	114.6
HC-SF152G2	HC-SFS152G2 HC-SFS1524G2	1.5	BL4-29B-15MEH	1/29	165.53	16.18	9.49	119.0
HC-SF152G2	HC-SFS152G2 HC-SFS1524G2	1.5	BL4-45B-15MEH	1/45	145.02	16.30	9.61	119.0

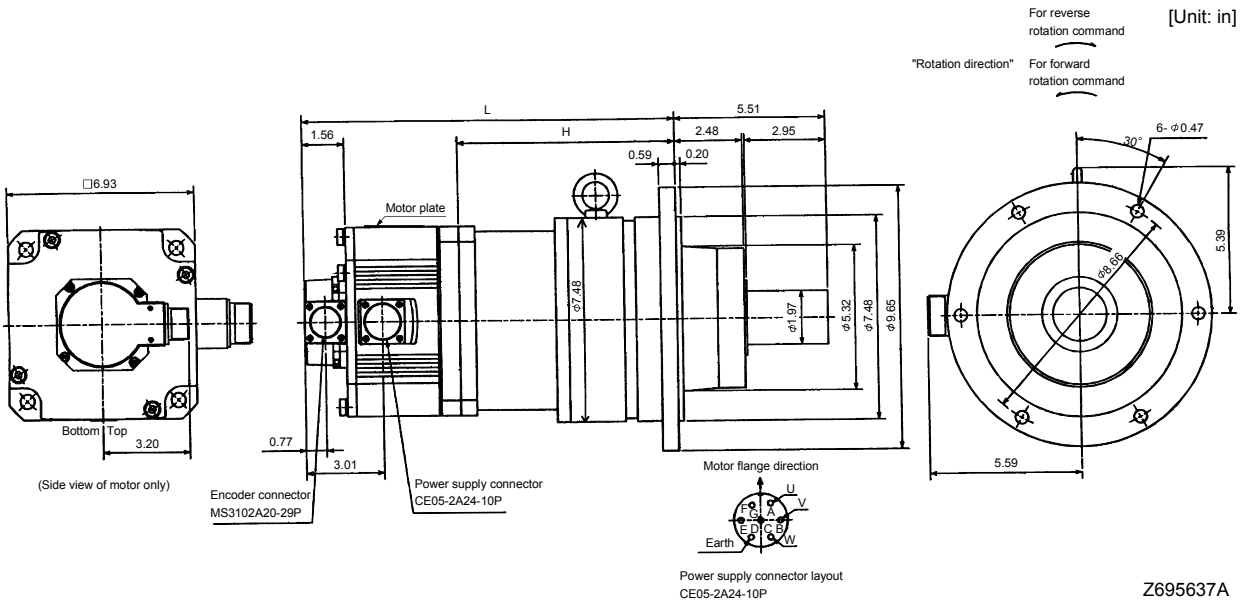
[Unit: in]



Z695322*
(BC11851*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in]		Mass [lb]
						L	H	
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL3-05B-20MEH	1/5	271.19	13.70	7.99	66.1
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL3-09B-20MEH	1/9	258.06	14.76	9.06	81.6

[Unit: in]

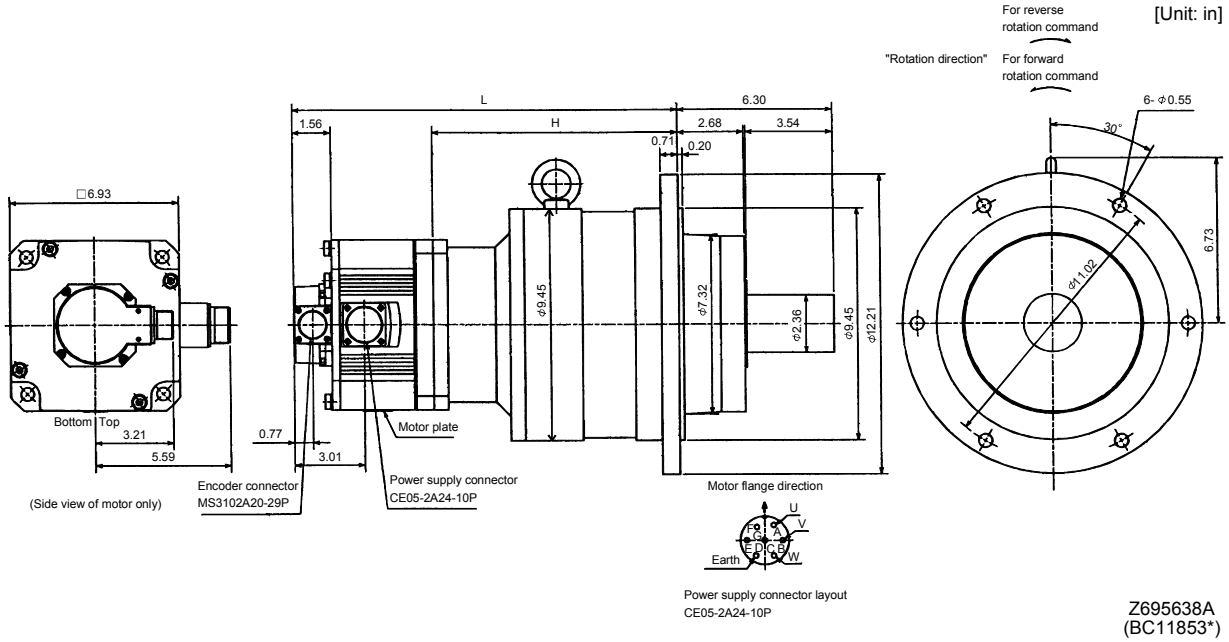


Z695637A
(BC11852*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]		Inertia Moment WK^2[oz · in^2]	Mass [lb]
					L	H		
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL4-20B-20MEH	1/20	10.32	326.0	16.02	125.7
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL4-29B-20MEH	1/29	10.32	288.82	16.02	125.7
HC-SF202G2	HC-SFS202G2 HC-SFS2024G2	2.0	BL4-45B-20MEH	1/45	10.43	268.32	16.14	125.7
HC-SF352G2	HC-SFS352G2 HC-SFS3524G2	3.5	BL4-05B-35MEH	1/5	8.78	543.33	16.14	119.0
HC-SF352G2	HC-SFS352G2 HC-SFS3524G2	3.5	BL4-09B-35MEH	1/9	10.04	500.14	17.40	141.1
HC-SF352G2	HC-SFS352G2 HC-SFS3524G2	3.5	BL4-20B-35MEH	1/20	10.32	541.96	17.68	141.1

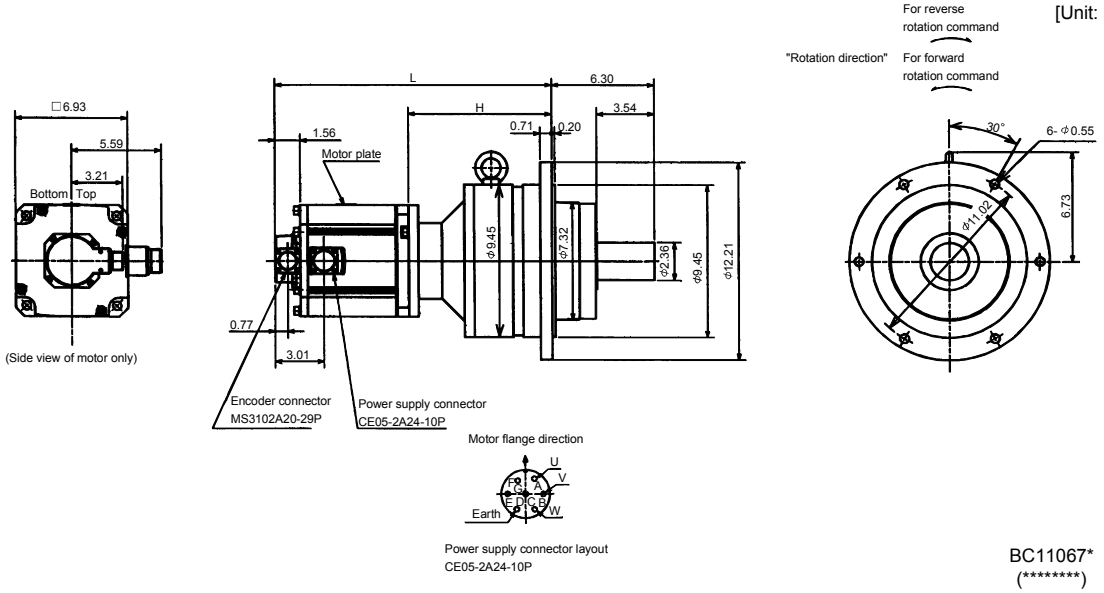
[Unit: in]



Z695638A
(BC11853*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]		Inertia Moment WK^2[oz · in^2]	Mass [lb]
					L	H		
HC-SF502G2	HC-SFS502G2 HC-SFS5024G2	5.0	BL4-05B-50MEH	1/5	16.97	10.04	647.35	127.9
HC-SF502G2	HC-SFS502G2 HC-SFS5024G2	5.0	BL4-09B-50MEH	1/9	18.23	8.78	604.15	149.9

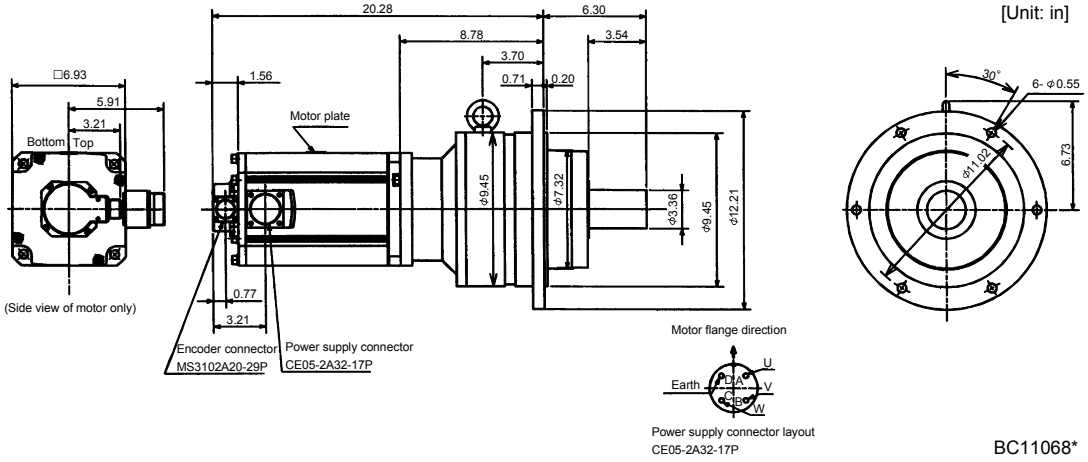
[Unit: in]



BC11067*
(********)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HC-SF702G2	HC-SFS702G2 HC-SFS7024G2	7.0	BL4-05B-70MEH	1/5	969.93	147.7

[Unit: in]

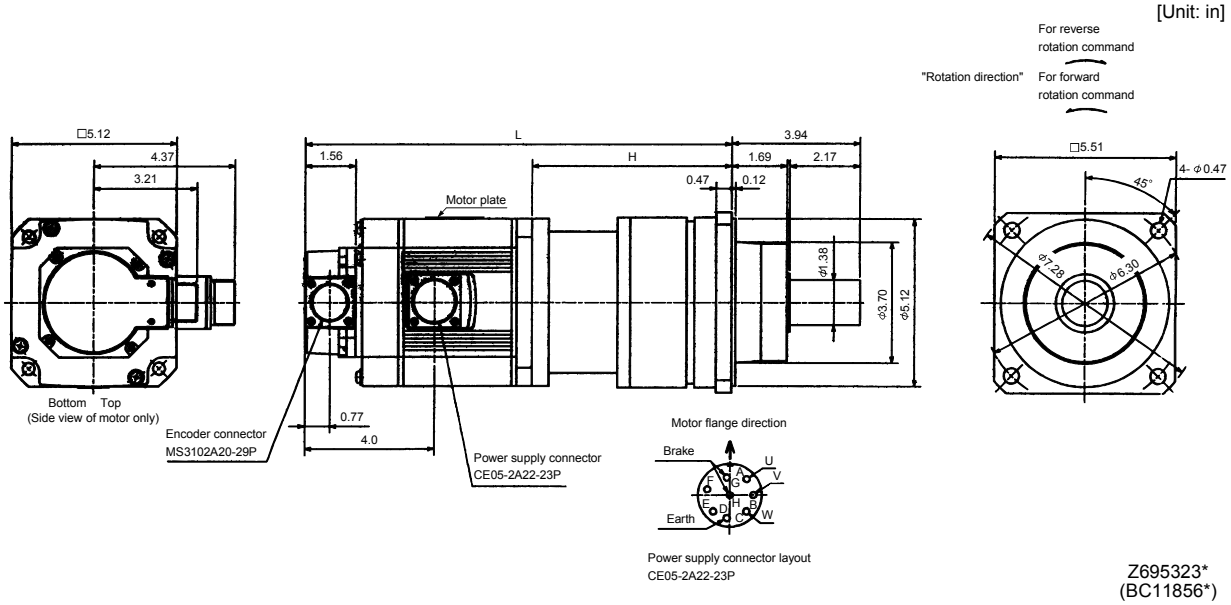


BC11068*
(********)

(b) With electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Mass [lb]
						L	H		
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-05B-05MEH	1/5	52.49	12.17	6.14	1204	33.1
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-09B-05MEH	1/9	50.57	12.64	6.61	1204	33.1
HC-SF52BG2	HC-SFS52BG2 HC-SFS524BG2	0.5	BL2-20B-05MEH	1/20	53.17	13.47	7.44	1204	37.5
HC-SF102BG2	HC-SFS102BG2 HC-SFS1024BG2	1.0	BL2-05B-10MEH	1/5	91.17	13.15	6.14	1204	37.5
HC-SF102BG2	HC-SFS102BG2 HC-SFS1024BG2	1.0	BL2-09B-10MEH	1/9	89.26	13.62	6.61	1204	37.5
HC-SF152BG2	HC-SFS152BG2 HC-SFS1524BG2	1.5	BL2-05B-15MEH	1/5	125.34	14.13	6.14	1204	41.9

[Unit: in]

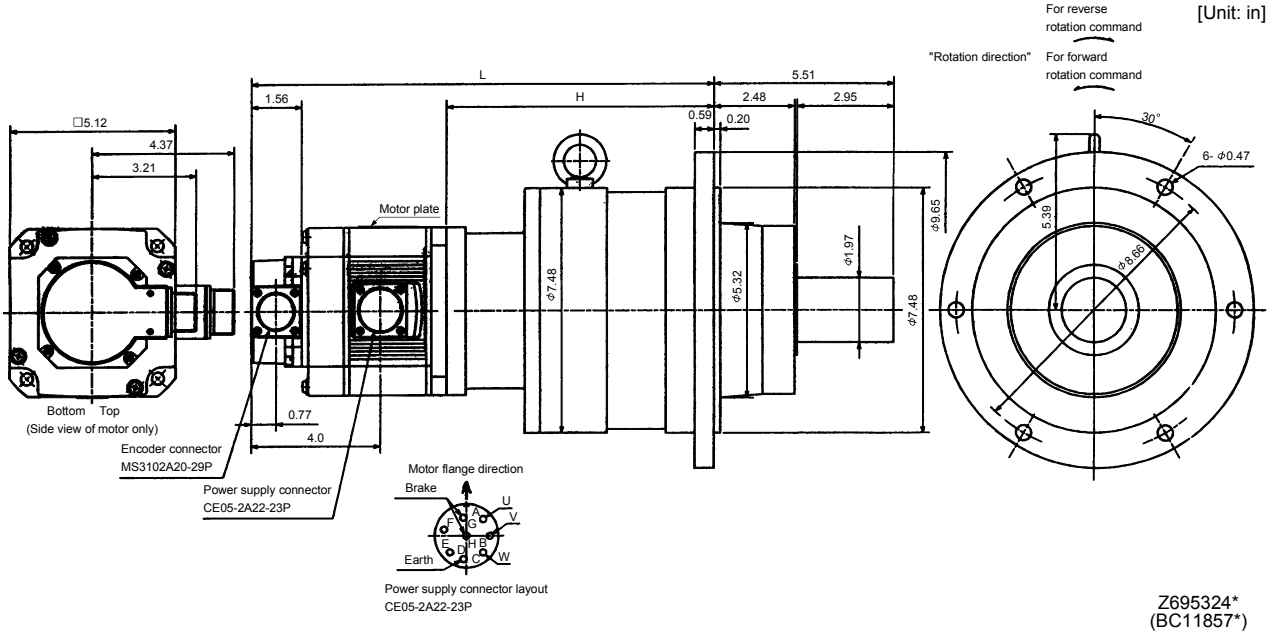


Z695323*
(BC11856*)

7. OUTLINE DIMENSION DRAWINGS

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Mass [lb]
							L	H		
HC-SF52BG2	HC-SFS52BG2	HC-SFS524BG2	0.5	BL3-29B-05MEH	1/29	60.69	14.57	8.54	1204	70.5
HC-SF52BG2	HC-SFS52BG2	HC-SFS524BG2	0.5	BL3-45B-05MEH	1/45	55.36	14.80	8.78	1204	70.5
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL3-20B-10MEH	1/20	109.76	15.55	8.54	1204	75.0
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL3-29B-10MEH	1/29	99.37	15.55	8.54	1204	75.0
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL3-09B-15MEH	1/9	144.07	16.22	8.23	1204	79.4
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL3-20B-15MEH	1/20	143.93	16.54	8.54	1204	79.4

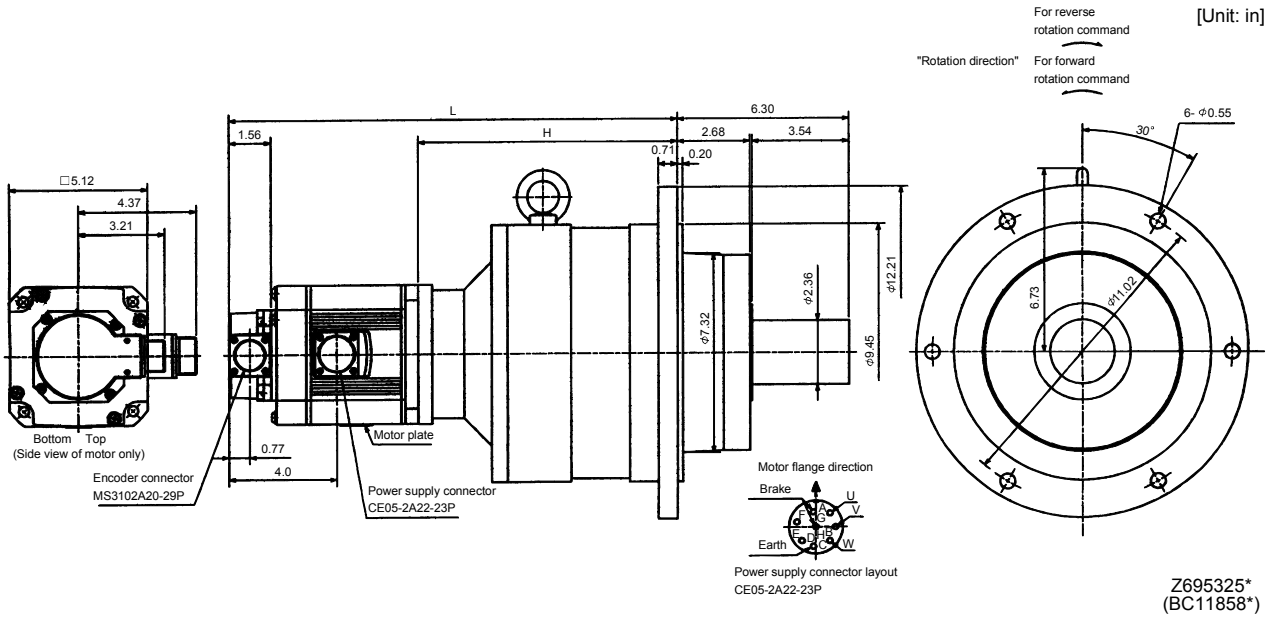
[Unit: in]



Z695324*
(BC11857*)

Model			Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Mass [lb]
							L	H		
HC-SF102BG2	HC-SFS102BG2	HC-SFS1024BG2	1.0	BL4-45B-10MEH	1/45	120.15	16.61	9.61	1204	114.6
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL4-29B-15MEH	1/29	174.82	17.48	9.49	1204	123.5
HC-SF152BG2	HC-SFS152BG2	HC-SFS1524BG2	1.5	BL4-45B-15MEH	1/45	154.32	17.60	9.61	1204	123.5

[Unit: in]

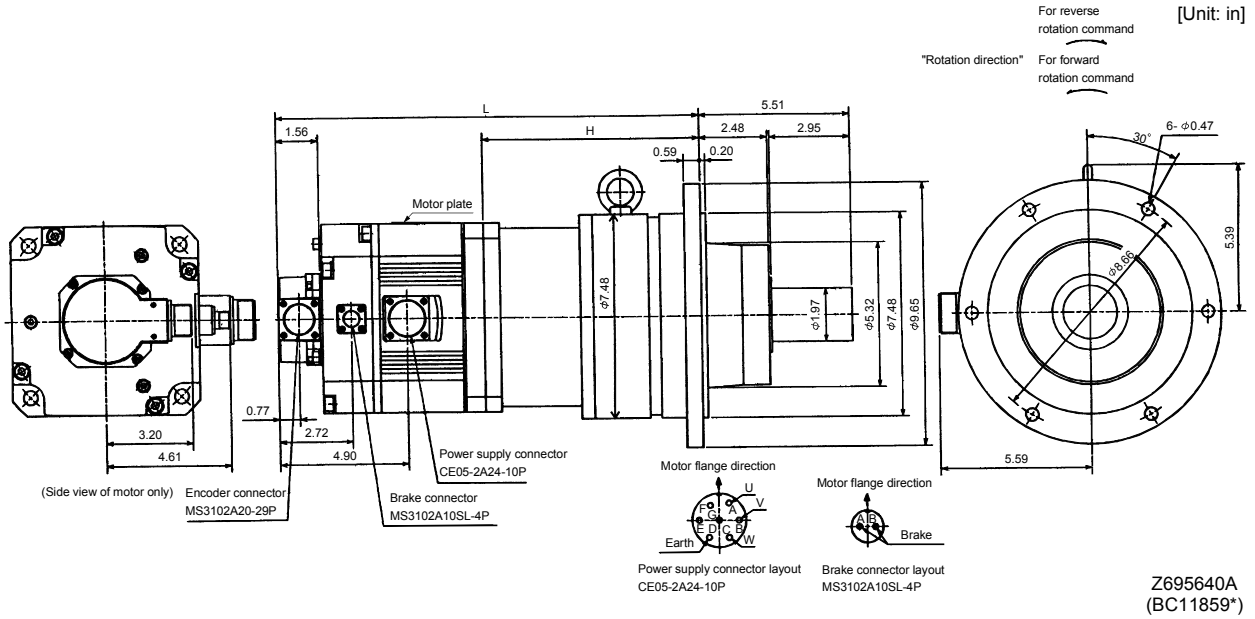


Z695325*
(BC11858*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
					L	H			
HC-SF202BG2	HC-SFS202BG2 HC-SFS2024BG2	2.0	BL3-05B-20MEH	1/5	15.59	7.99	6103	325.86	79.4
HC-SF202BG2	HC-SFS202BG2 HC-SFS2024BG2	2.0	BL3-09B-20MEH	1/9	16.65	9.06	6103	312.74	94.8

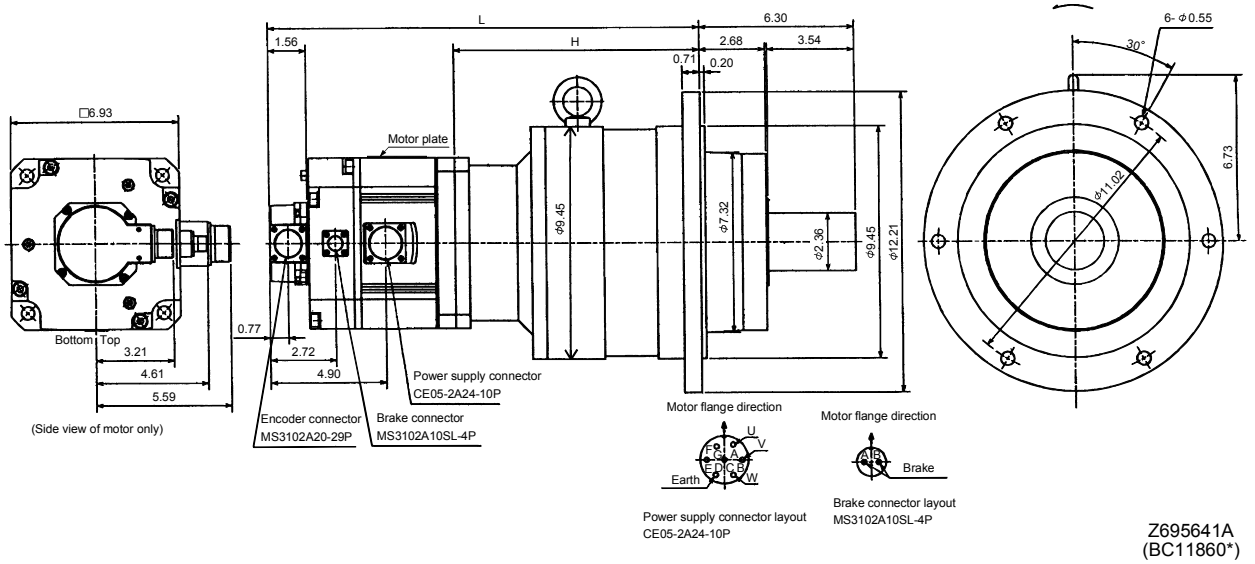
[Unit: in]



Z695640A
(BC11859*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
					L	H			
HC-SF202BG2	HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-20B-20MEH	1/20	17.91	10.32	6103	380.67	138.9
HC-SF202BG2	HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-29B-20MEH	1/29	17.91	10.32	6103	343.49	138.9
HC-SF202BG2	HC-SFS202BG2 HC-SFS2024BG2	2.0	BL4-45B-20MEH	1/45	18.03	10.43	6103	322.99	138.9
HC-SF352BG2	HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-05B-35MEH	1/5	18.03	8.78	6103	598.0	132.3
HC-SF352BG2	HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-09B-35MEH	1/9	19.29	10.04	6103	554.81	154.3
HC-SF352BG2	HC-SFS352BG2 HC-SFS3524BG2	3.5	BL4-20B-35MEH	1/20	19.57	10.32	6103	596.64	154.3

[Unit: in]

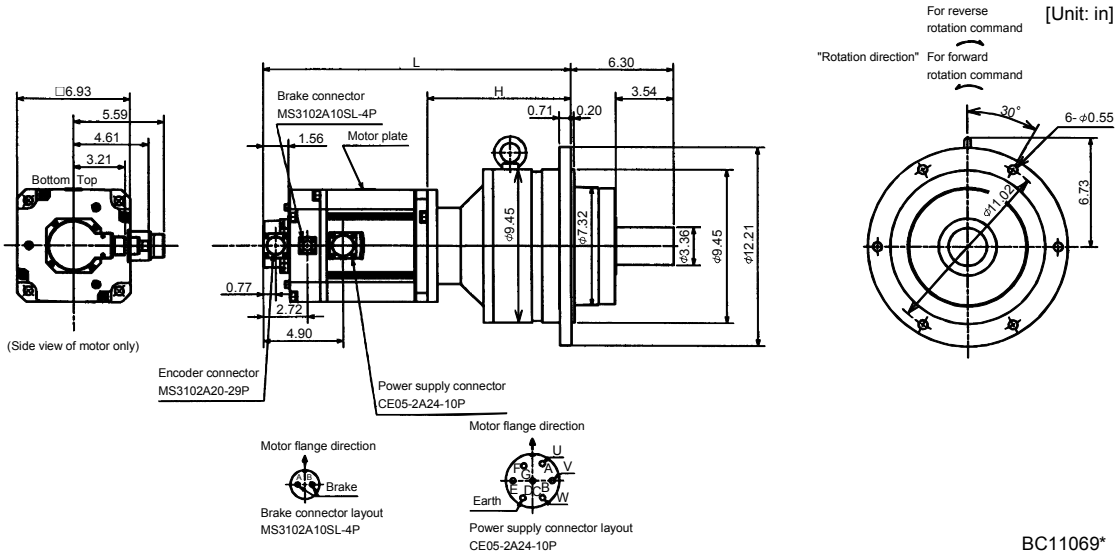


Z695641A
(BC11860*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]		Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
					L	H			
HC-SF502BG2	HC-SFS502BG2 HC-SFS5024BG2	5.0	BL4-05B-50MEH	1/5	18.86	8.78	702.02	141.1	6103
HC-SF502BG2	HC-SFS502BG2 HC-SFS5024BG2	5.0	BL4-09B-50MEH	1/9	20.12	10.04	658.83	163.1	6103

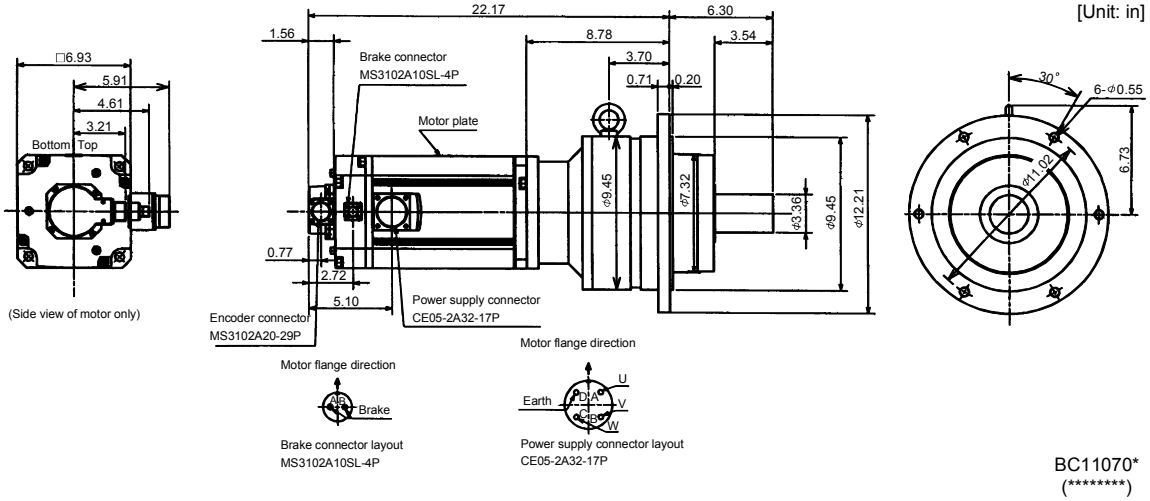
[Unit: in]



BC11069*
(********)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]	Brake static friction torque [oz ▪ in]
HC-SF702BG2	HC-SFS702BG2 HC-SFS7024BG2	7.0	BL4-05B-70MEH	1/5	1024.60	160.9	6103

[Unit: in]



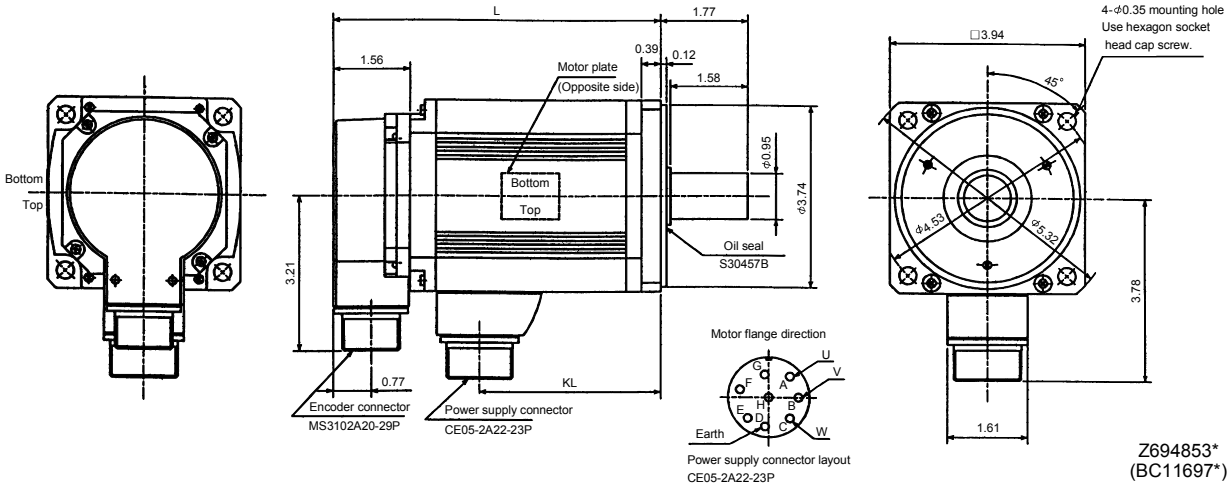
BC11070*
(********)

7.2.4 HC-RF・HC-RFS series

(1) Standard (without electromagnetic brake, without reduction gear)

Model		Output [kW]	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Mass [lb]
				L	KL	
HC-RF103	HC-RFS103	1.0	8.20	5.79	2.80	8.6
HC-RF153	HC-RFS153	1.5	10.39	6.77	3.78	11.0
HC-RF203	HC-RFS203	2.0	12.58	7.76	4.76	13.7

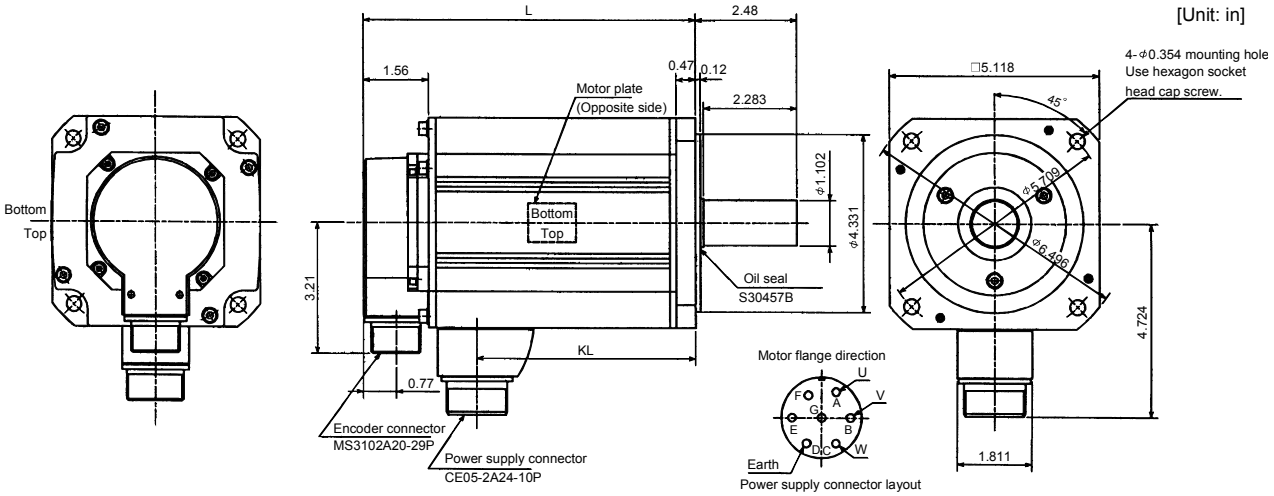
[Unit: in]



Z694853*
(BC11697*)

Model		Output [kW]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
			L	KL		
HC-RF353	HC-RFS353	3.5	8.543	5.827	47.02	26.5
HC-RF503	HC-RFS503	5.0	10.787	8.071	65.609	37.5

[Unit: in]

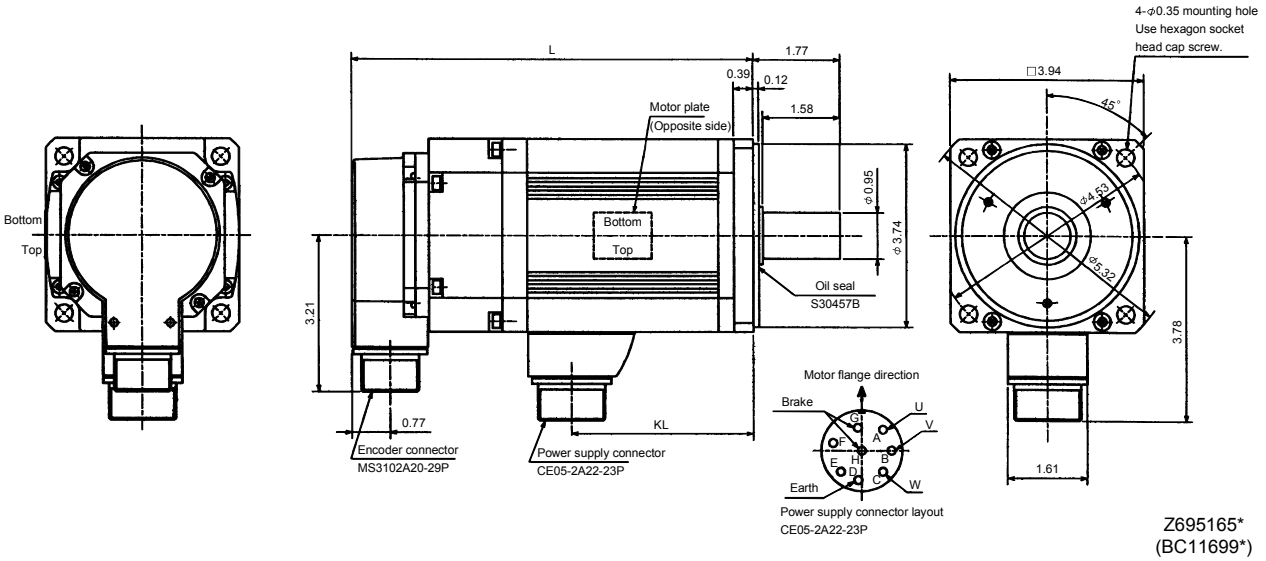


Z695780*
(BC11698*)

(2) With electromagnetic brake

Model	Output [kW]	Inertia Moment WK^2[oz ▪ in^2]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Mass [lb]
			L	KL		
HC-RF103B HC-RFS103B	1.0	10.12	7.28	2.80	991	13.2
HC-RF153B HC-RFS153B	1.5	12.30	8.27	3.78	991	15.4
HC-RF203B HC-RFS203B	2.0	14.49	9.25	4.76	991	18.3

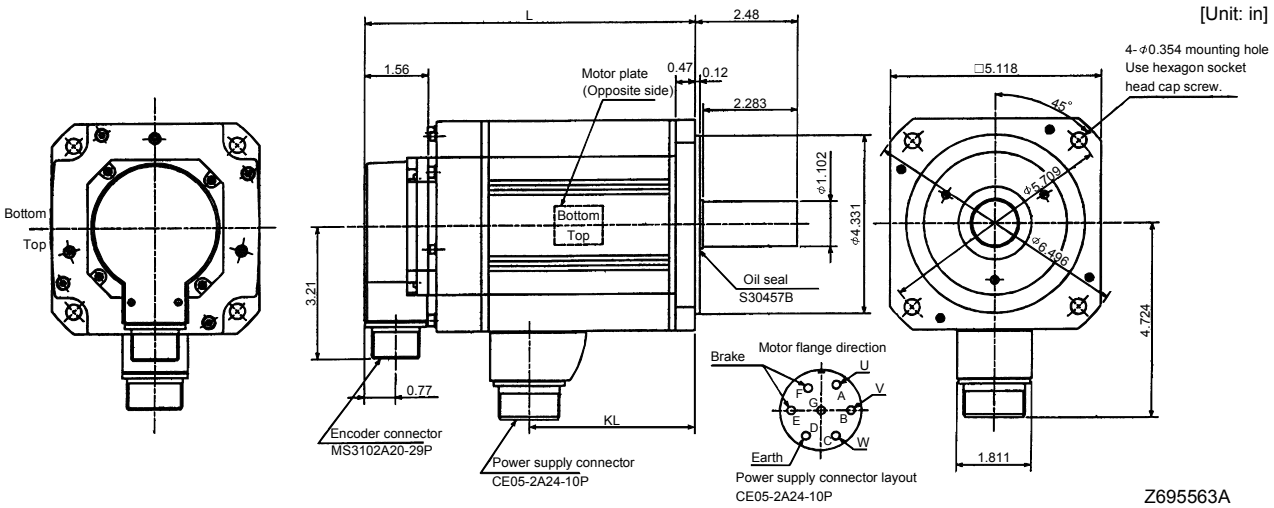
[Unit: in]



Z695165*
(BC11699*)

Model	Output [kW]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL			
HC-RF353B HC-RFS353B	3.5	10	5.827	2365	64.516	33.1
HC-RF503B HC-RFS503B	5.0	12.244	8.071	2365	84.745	46.3

[Unit: in]



Z695563A
(BC11700*)

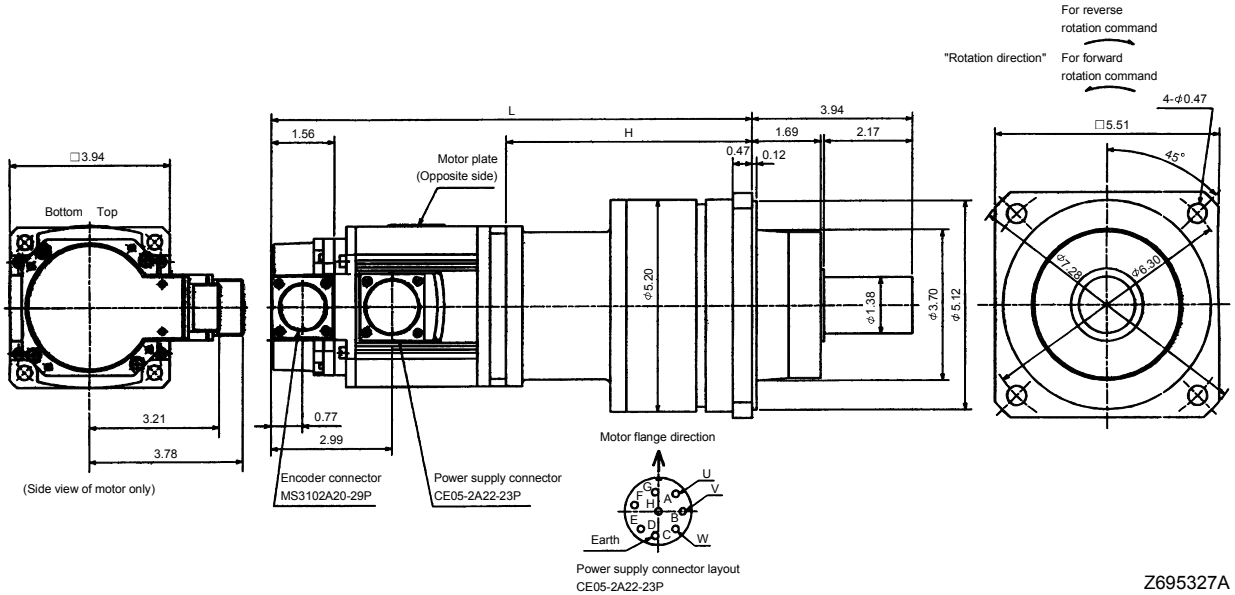
(3) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]		Mass [lb]
						L	KL	
HC-RF103G2	HC-RFS103G2	1.0	BL2-05B-10MEKD	1/5	27.06	11.85	6.06	26.2
HC-RF103G2	HC-RFS103G2	1.0	BL2-09B-10MEKD	1/9	25.15	12.32	6.54	26.2
HC-RF153G2	HC-RFS153G2	1.5	BL2-05B-15MEKD	1/5	29.25	12.84	6.06	28.7
HC-RF203G2	HC-RFS203G2	2.0	BL2-05B-20MEKD	1/5	31.44	13.82	6.06	31.3

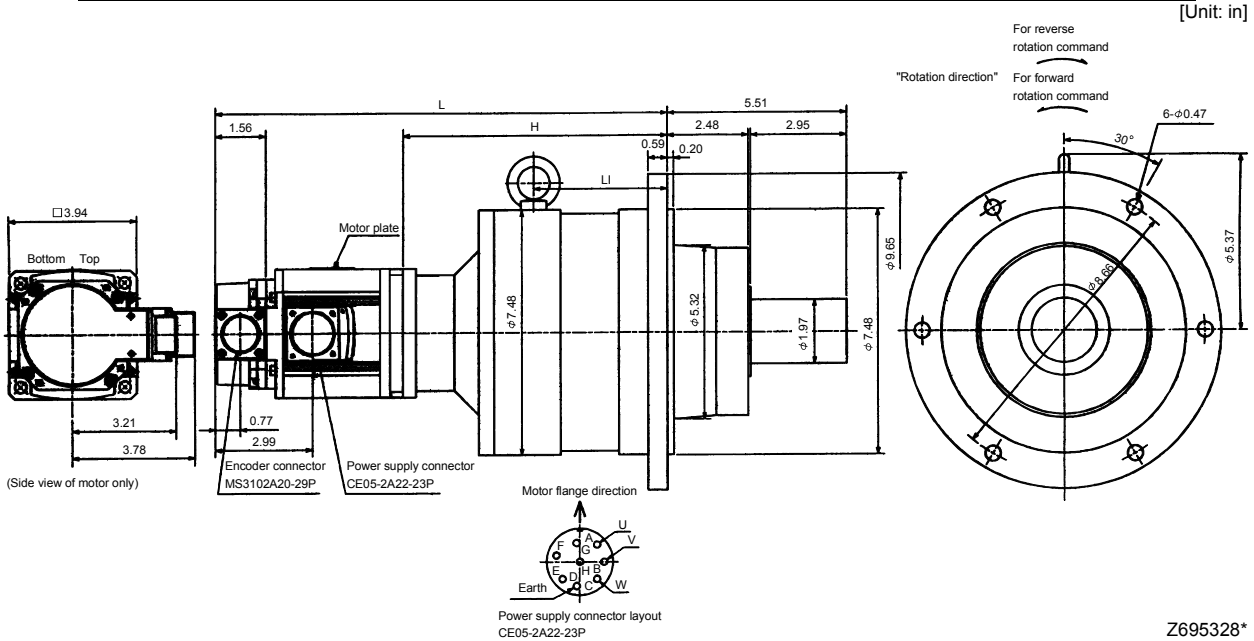
[Unit: in]



Z695327A

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Variable Dimensions [in]			Mass [lb]
						L	H	Ll	
HC-RF103G2	HC-RFS103G2	1.0	BL3-20B-10MEKD	1/20	45.65	13.94	8.15	4.13	63.7
HC-RF103G2	HC-RFS103G2	1.0	BL3-29B-10MEKD	1/29	35.27	13.94	8.15	4.13	63.7
HC-RF103G2	HC-RFS103G2	1.0	BL3-45B-10MEKD	1/45	29.93	14.33	8.54	4.53	63.7
HC-RF153G2	HC-RFS153G2	1.5	BL3-09B-15MEKD	1/9	36.50	14.76	7.99	3.98	66.1
HC-RF153G2	HC-RFS153G2	1.5	BL3-20B-15MEKD	1/20	47.84	14.92	8.15	4.13	66.1
HC-RF153G2	HC-RFS153G2	1.5	BL3-29B-15MEKD	1/29	37.45	14.92	8.15	4.13	66.1
HC-RF203G2	HC-RFS203G2	2.0	BL3-09B-20MEKD	1/9	38.71	15.75	7.99	3.98	68.8
HC-RF203G2	HC-RFS203G2	2.0	BL3-20B-20MEKD	1/20	50.03	15.91	8.15	4.13	68.8

[Unit: in]

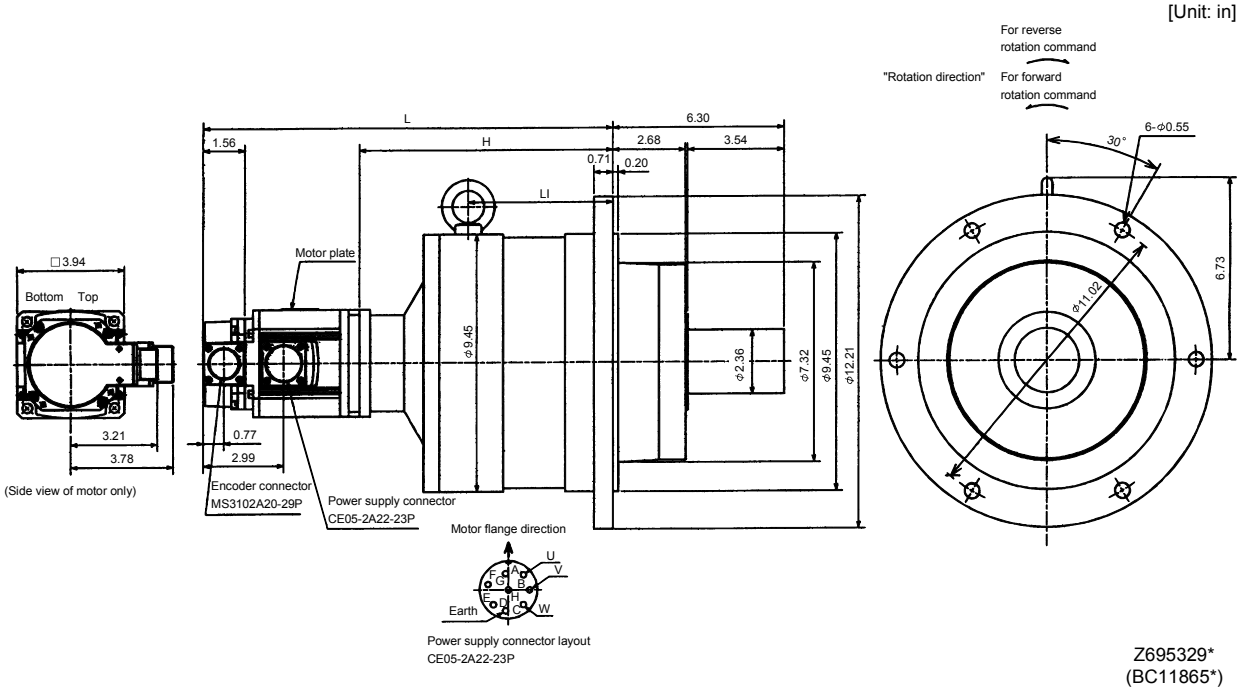


Z695328*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Variable Dimensions [in]			Mass [lb]
					L	H	LI	
HC-RF153G2 HC-RFS153G2	1.5	BL4-45B-15MEKD	1/45	46.75	16.14	9.37	5.35	110.2
HC-RF203G2 HC-RFS203G2	2.0	BL4-29B-20MEKD	1/29	69.44	16.73	8.98	4.96	112.9
HC-RF203G2 HC-RFS203G2	2.0	BL4-45B-20MEKD	1/45	48.93	17.13	9.37	5.35	112.9

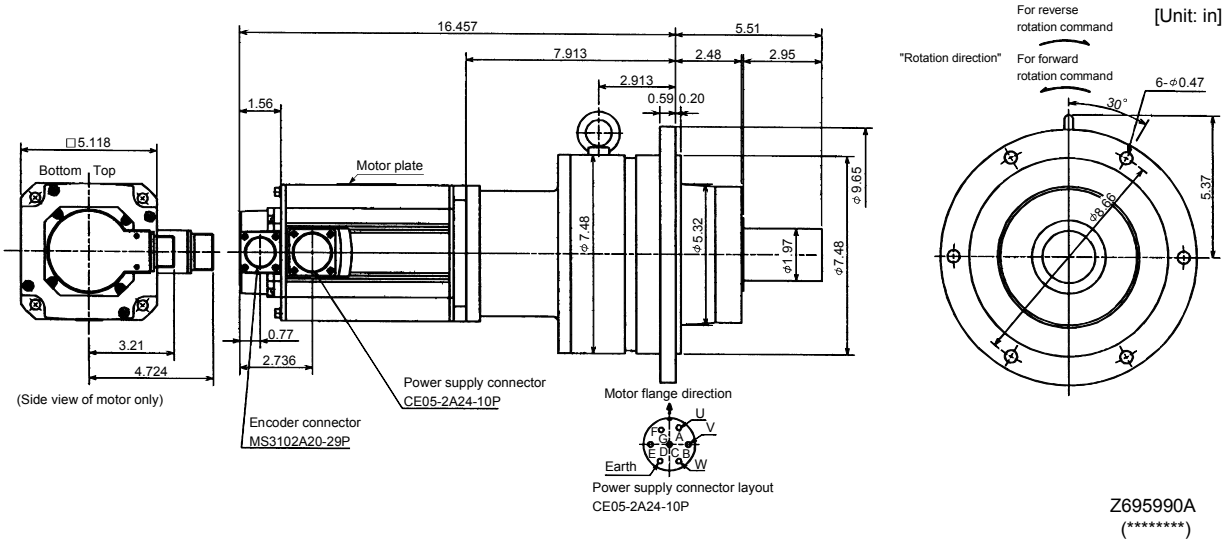
[Unit: in]



Z695329*
(BC11865*)

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-RF353G2 HC-RFS353G2	3.5	BL3-05B-35MEKD	1/5	102.788	66.1

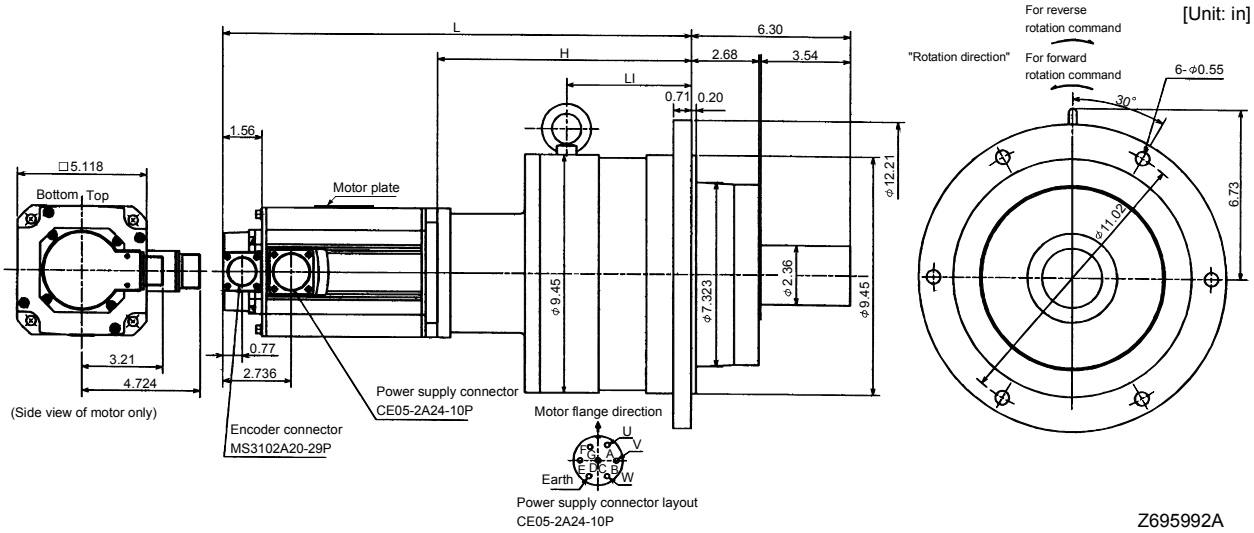
[Unit: in]



Z695990A
(********)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in]			Mass [lb]
						L	H	Ll	
HC-RF353G2	HC-RFS353G2	3.5	BL4-09B-35MEKD	1/9	115.363	18.504	9.961	4.961	125.7
HC-RF353G2	HC-RFS353G2	3.5	BL4-20B-35MEKD	1/20	157.462	18.504	9.961	4.961	125.7
HC-RF353G2	HC-RFS353G2	3.5	BL4-29B-35MEKD	1/29	120.284	18.504	9.961	4.961	125.7
HC-RF503G2	HC-RFS503G2	5.0	BL4-05B-50MEKD	1/5	177.145	19.488	8.701	3.701	114.6
HC-RF503G2	HC-RFS503G2	5.0	BL4-09B-50MEKD	1/9	133.952	20.748	9.961	4.961	136.7
HC-RF503G2	HC-RFS503G2	5.0	BL4-20B-50MEKD	1/20	176.052	20.748	9.961	4.961	136.7

[Unit: in]

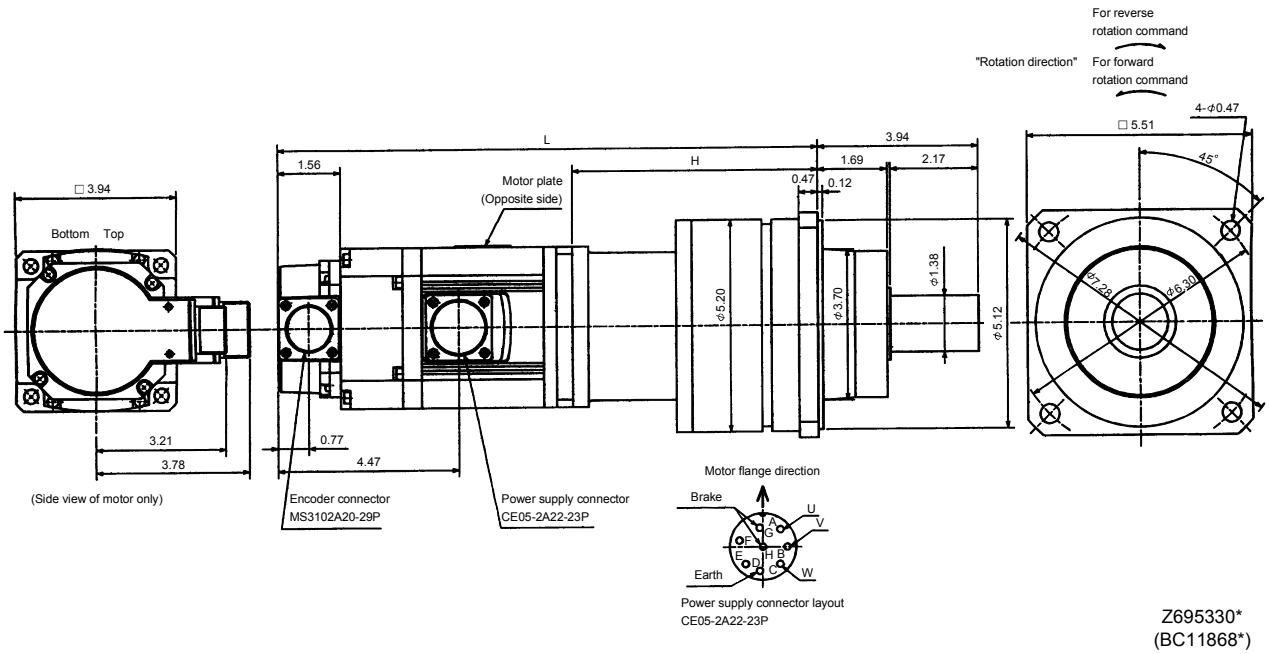


Z695992A
(********)

(b) With electromagnetic brake

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Variable Dimensions [in]		Brake static friction torque [oz·in]	Mass (lb)
						L	H		
HC-RF103BG2	HC-RFS103BG2	1.0	BL2-05B-10MEKD	1/5	28.98	13.35	6.06	991	30.9
HC-RF103BG2	HC-RFS103BG2	1.0	BL2-09B-10MEKD	1/9	27.06	13.82	6.54	991	30.9
HC-RF153BG2	HC-RFS153BG2	1.5	BL2-05B-15MEKD	1/5	31.16	14.33	6.06	991	33.3
HC-RF203BG2	HC-RFS203BG2	2.0	BL2-05B-20MEKD	1/5	33.35	15.32	6.06	991	35.9

[Unit: in]

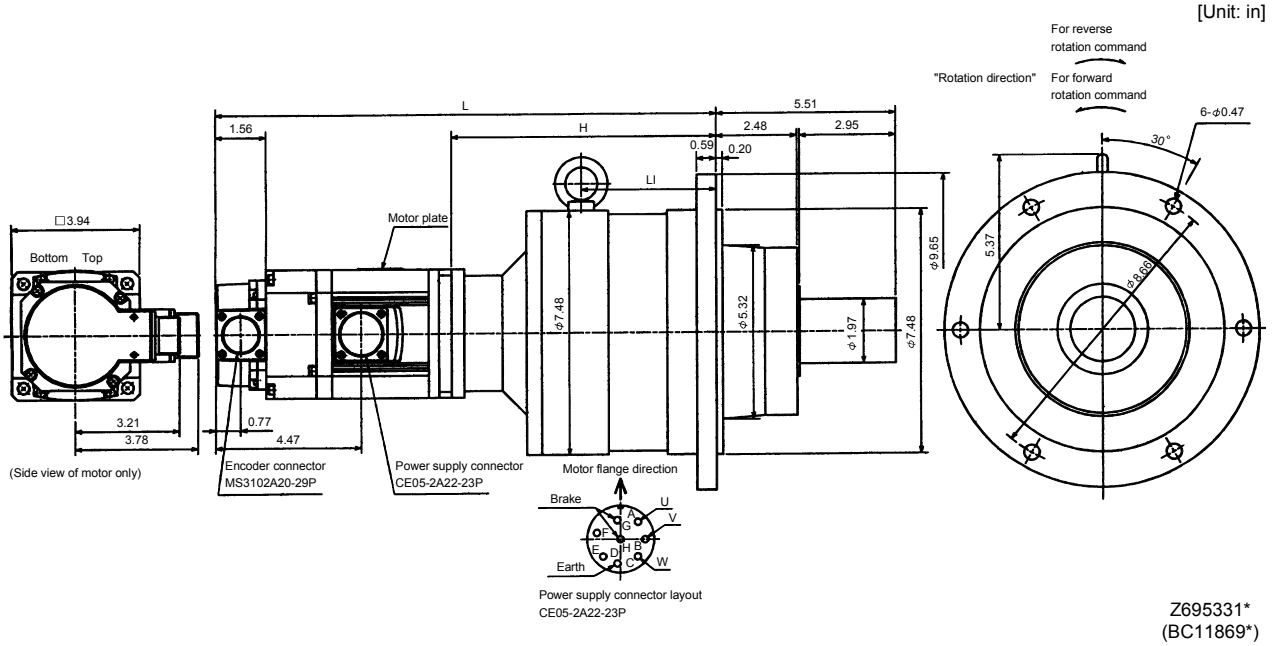


Z695330*
(BC11868*)

7. OUTLINE DIMENSION DRAWINGS

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in]			Brake static friction torque [oz · in]	Mass [lb]
						L	H	Ll		
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-20B-10MEKD	1/20	47.57	15.43	8.15	4.13	991	68.3
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-29B-10MEKD	1/29	37.18	15.43	8.15	4.13	991	68.3
HC-RF103BG2	HC-RFS103BG2	1.0	BL3-45B-10MEKD	1/45	31.85	15.83	8.54	4.53	991	68.3
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-09B-15MEKD	1/9	38.41	16.26	7.99	3.98	991	70.8
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-20B-15MEKD	1/20	49.75	16.42	8.15	4.13	991	70.8
HC-RF153BG2	HC-RFS153BG2	1.5	BL3-29B-15MEKD	1/29	39.37	16.42	8.15	4.13	991	70.8
HC-RF203BG2	HC-RFS203BG2	2.0	BL3-09B-20MEKD	1/9	40.60	17.24	7.99	3.98	991	73.4
HC-RF203BG2	HC-RFS203BG2	2.0	BL3-20B-20MEKD	1/20	51.94	17.40	8.15	4.13	991	73.4

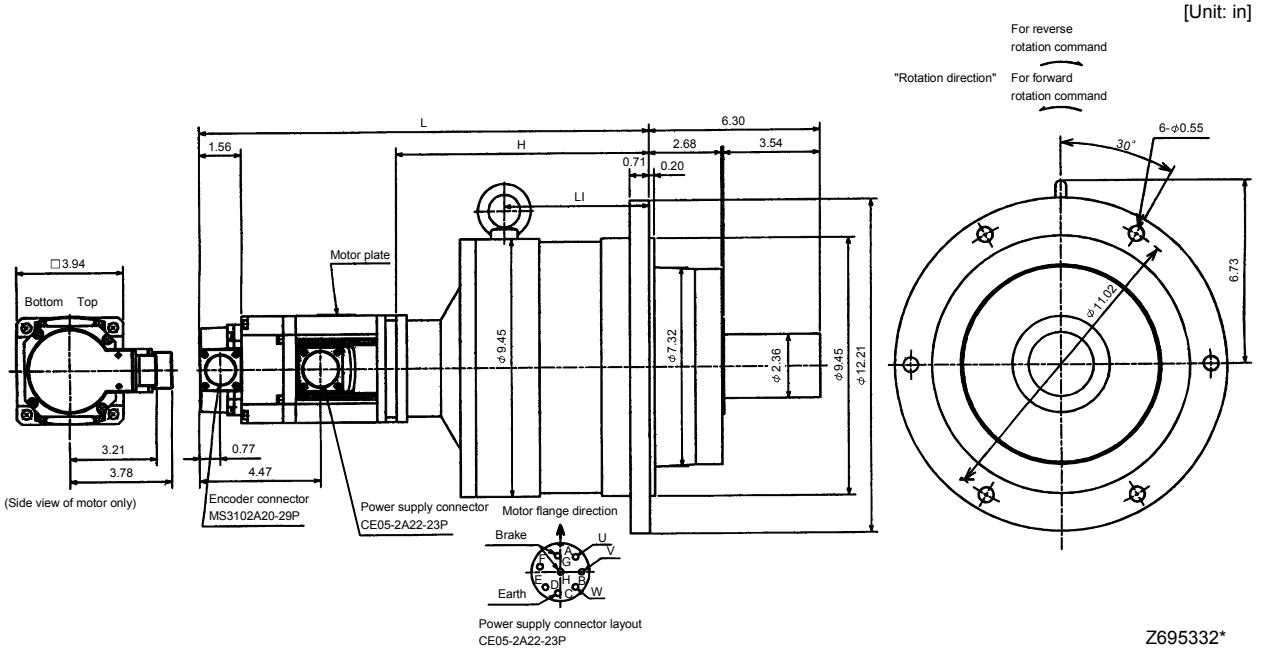
[Unit: in]



Z695331*
(BC11869*)

Model		Output [kW]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz · in^2]	Variable Dimensions [in]			Brake static friction torque [oz · in]	Mass [lb]
						L	H	Ll		
HC-RF153BG2	HC-RFS153BG2	1.5	BL4-45B-15MEKD	1/45	48.66	17.64	9.37	5.35	991	114.9
HC-RF203BG2	HC-RFS203BG2	2.0	BL4-29B-20MEKD	1/29	71.35	18.23	8.98	4.96	991	117.5
HC-RF203BG2	HC-RFS203BG2	2.0	BL4-45B-20MEKD	1/45	50.85	18.62	9.37	5.35	991	117.5

[Unit: in]

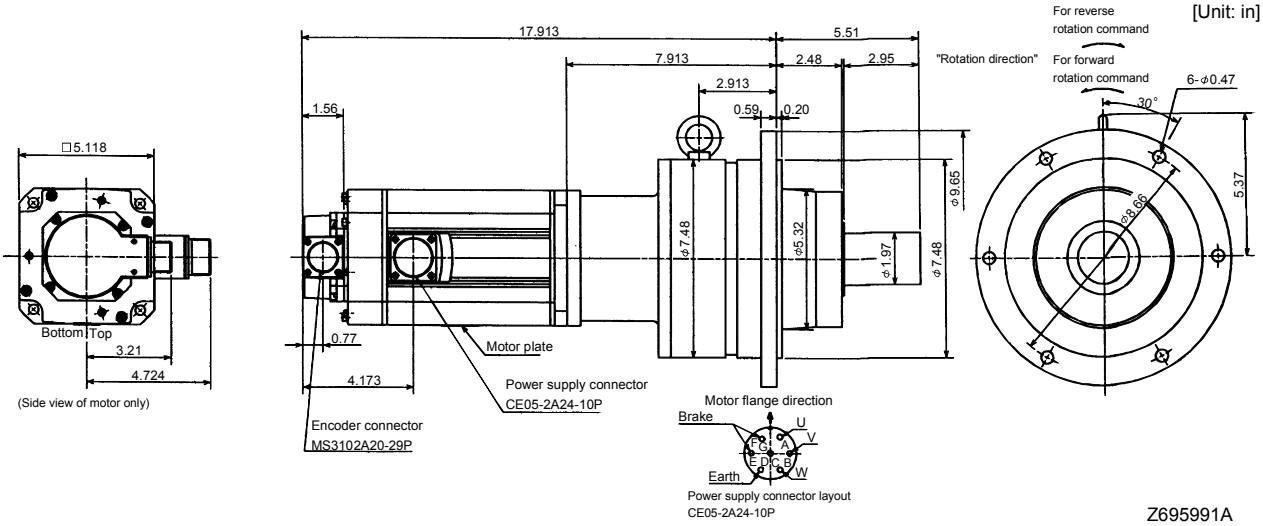


Z695332*
(BC11870*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-RF353BG2 HC-RFS353BG2	3.5	BL3-05B-35MEKD	1/5	2365	113.723	72.8

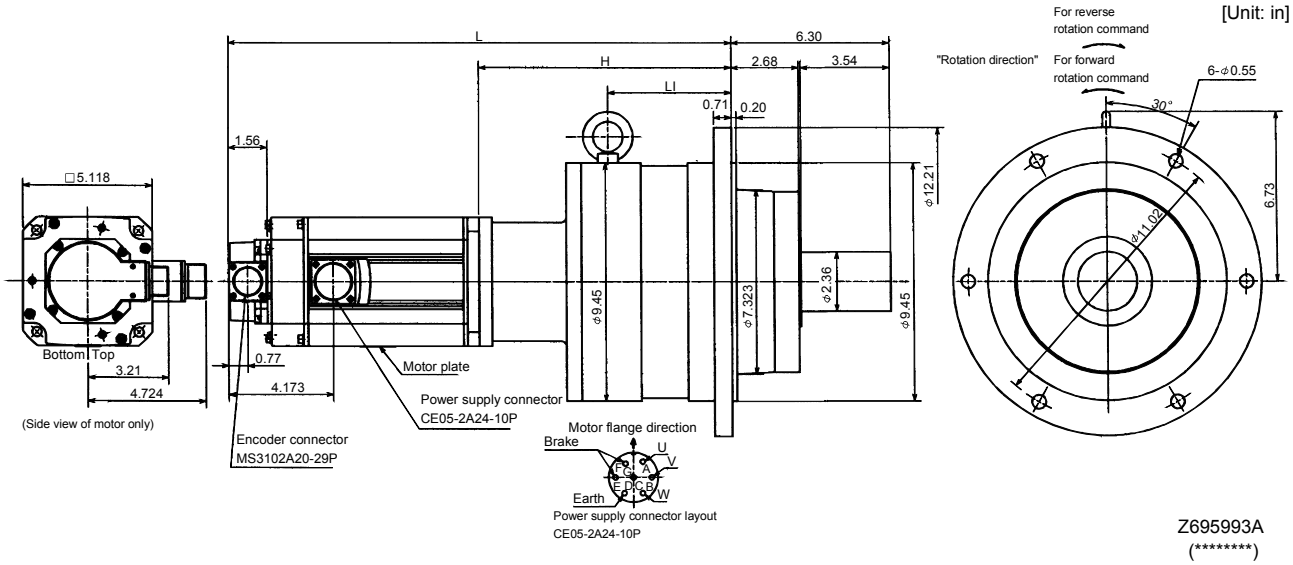
[Unit: in]



Z695991A
(********)

Model	Output [kW]	Reduction Gear Model	Reduction Ratio	Variable Dimensions [in]			Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
				L	H	Ll			
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-09B-35MEKD	1/9	19.961	9.961	4.961	2365	126.298	132.3
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-20B-35MEKD	1/20	19.961	9.961	4.961	2365	168.397	132.3
HC-RF353BG2 HC-RFS353BG2	3.5	BL4-29B-35MEKD	1/29	19.961	9.961	4.961	2365	120.284	132.3
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-05B-50MEKD	1/5	20.945	8.701	3.701	2365	188.08	123.5
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-09B-50MEKD	1/9	22.205	9.961	4.961	2365	144.887	145.5
HC-RF503BG2 HC-RFS503BG2	5.0	BL4-20B-50MEKD	1/20	22.205	9.961	4.961	2365	186.987	145.5

[Unit: in]



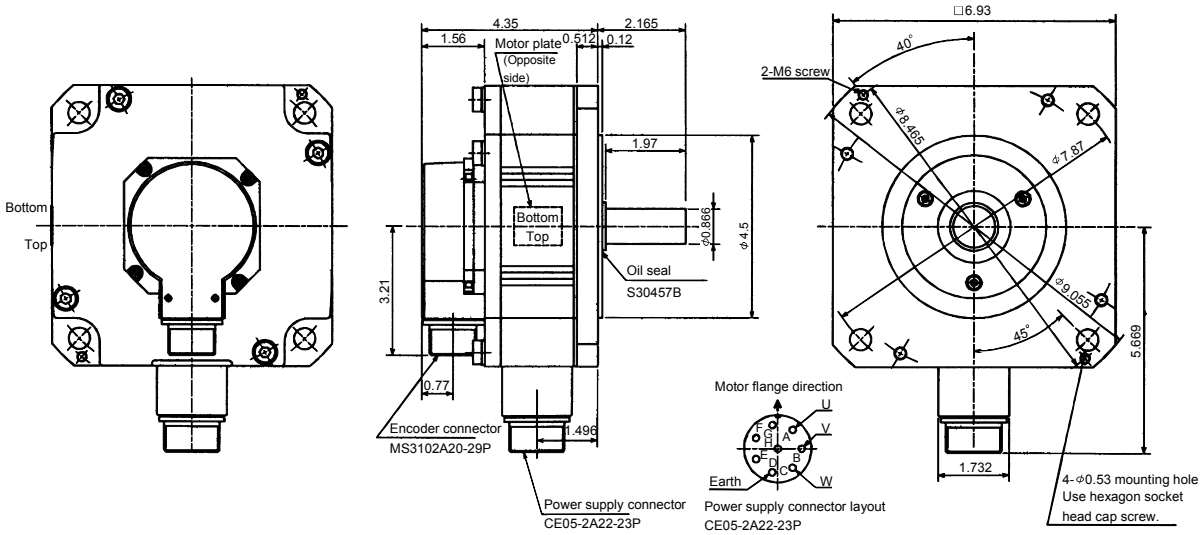
Z695993A
(********)

7.2.5 HC-UF 2000r/min • HC-UFS 2000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UF72 HC-UFS72	0.75	56.861	17.6

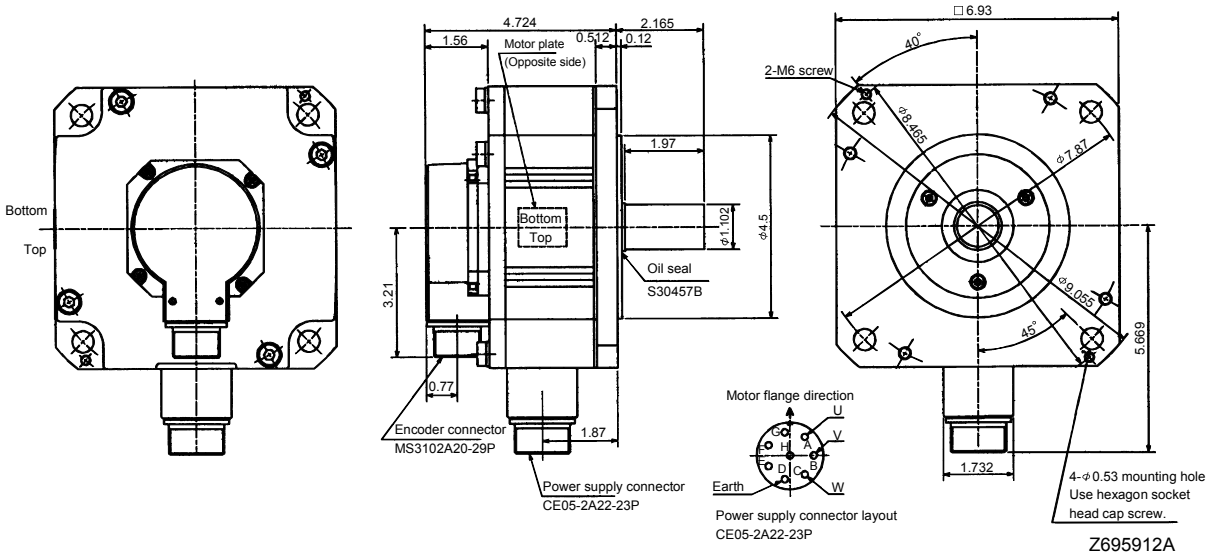
[Unit: in]



Z695911*
(BC11711*)

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UF152 HC-UFS152	1.5	120.831	24.3

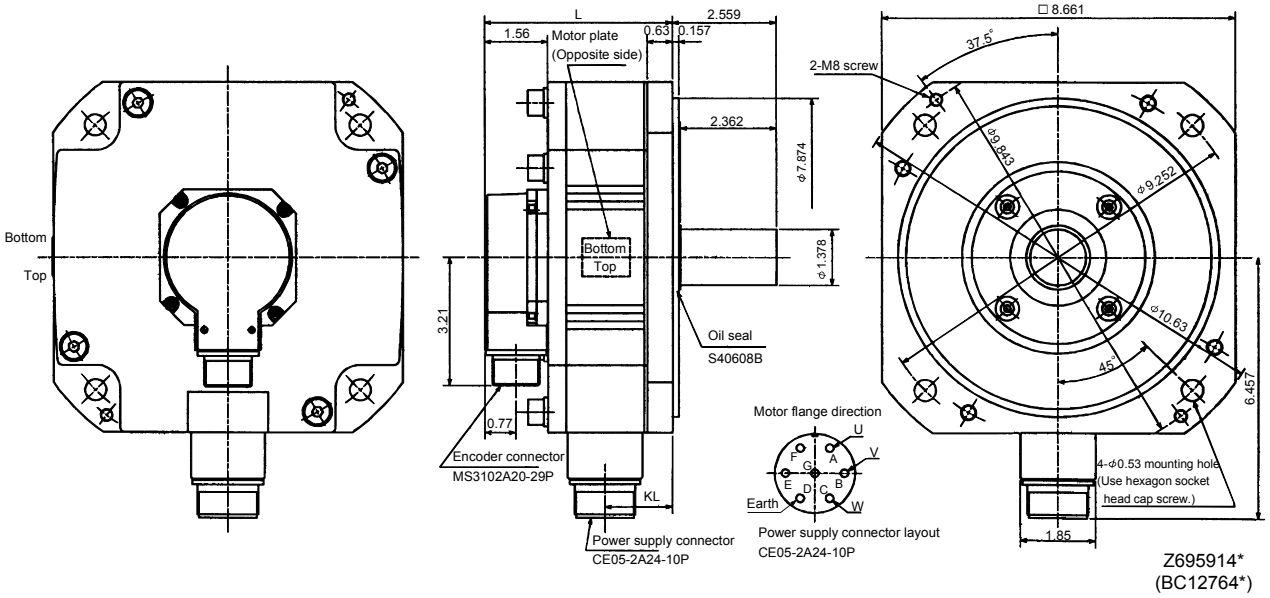
[Unit: in]



Z695912A
(BC11712*)

Model		Output [kW]	Variable Dimensions [in]		Inertia Moment WK^2[oz·in^2]	Mass [lb]
			L	KL		
HC-UF202	HC-UFS202	2.0	4.646	1.673	208.856	35.3
HC-UF352	HC-UFS352	3.5	5.591	2.618	418.26	44.1
HC-UF502	HC-UFS502	5.0	6.535	3.563	628.756	52.9

[Unit: in]

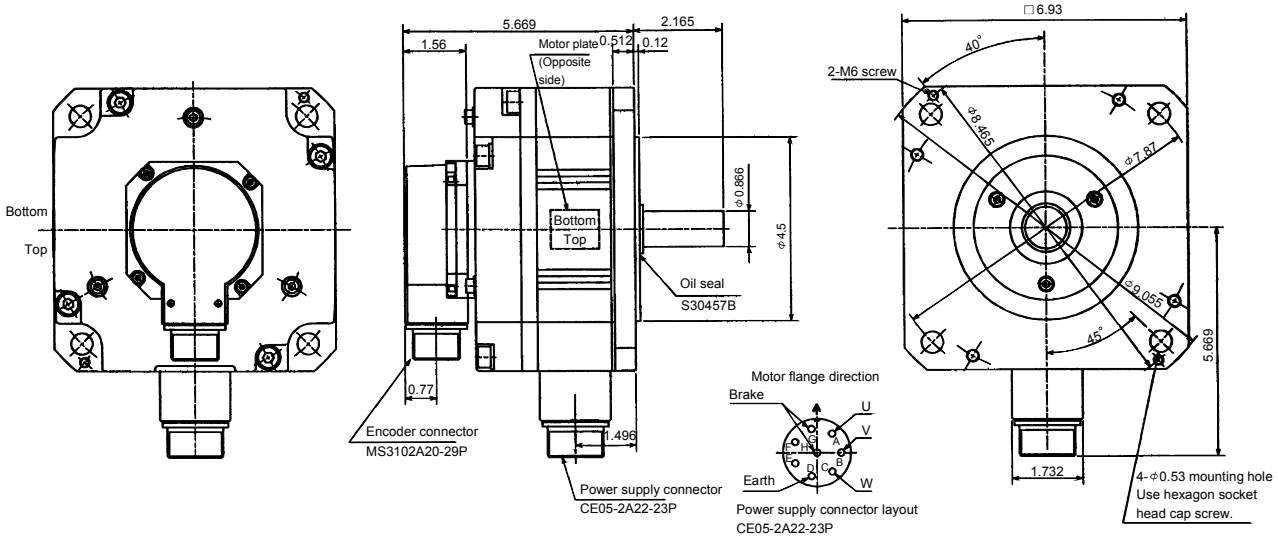


Z695914*
(BC12764*)

(2) With electromagnetic brake

Model		Output [kW]	Brake static friction torque [oz·in]	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-UF72B	HC-UFS72B	0.75	1204	67.796	22.0

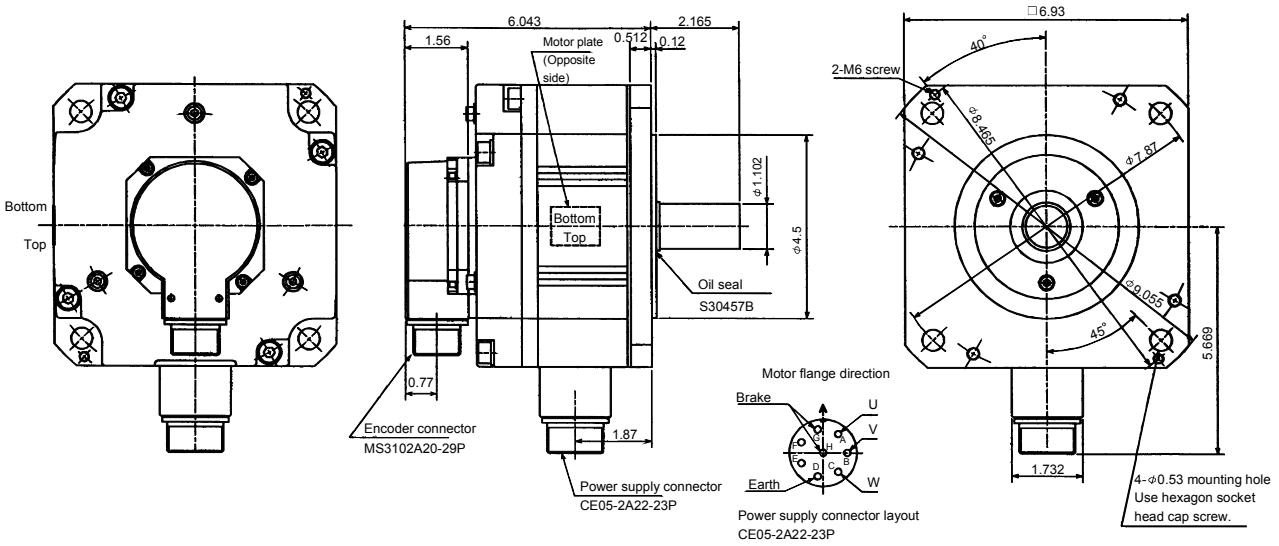
[Unit: in]



Z695981A
(BC11714*)

Model	Output [kW]	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF152B HC-UFS152B	1.5	1204	131.765	28.7

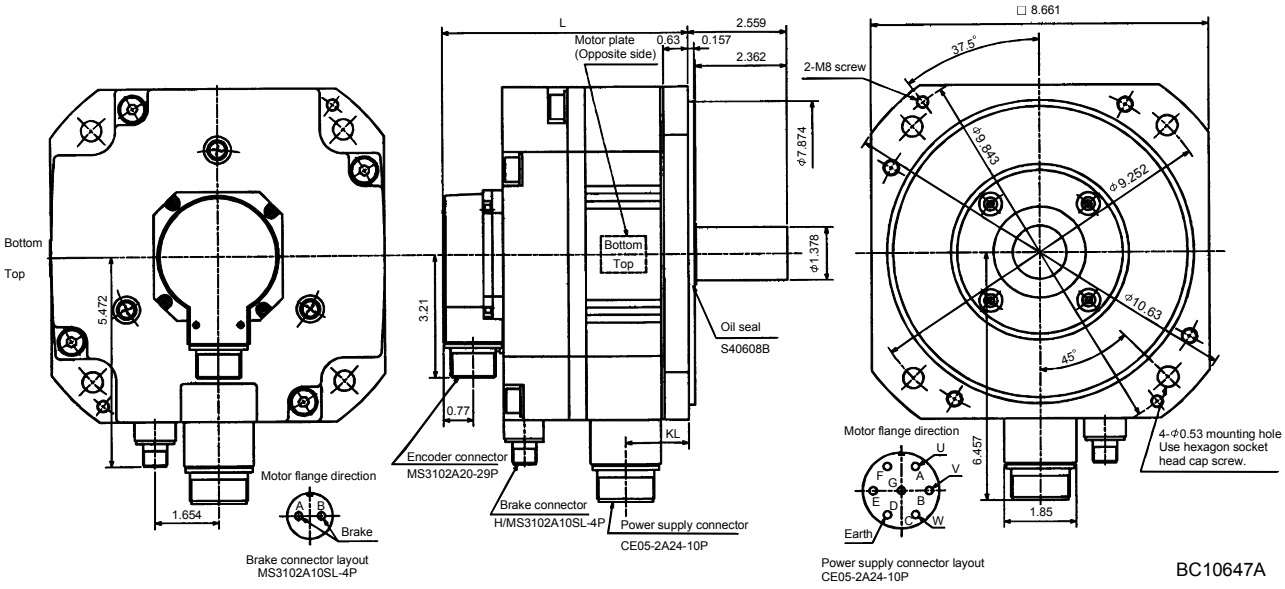
[Unit: in]



Z695982B
(BC11715*)

Model	Output [kW]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL			
HC-UF202B HC-UFS202B	2.0	6.339	1.673	6103	255.876	48.5
HC-UF352B HC-UFS352B	3.5	7.283	2.618	6103	465.28	57.3
HC-UF502B HC-UFS502B	5.0	8.228	3.563	6103	675.776	66.1

[Unit: in]



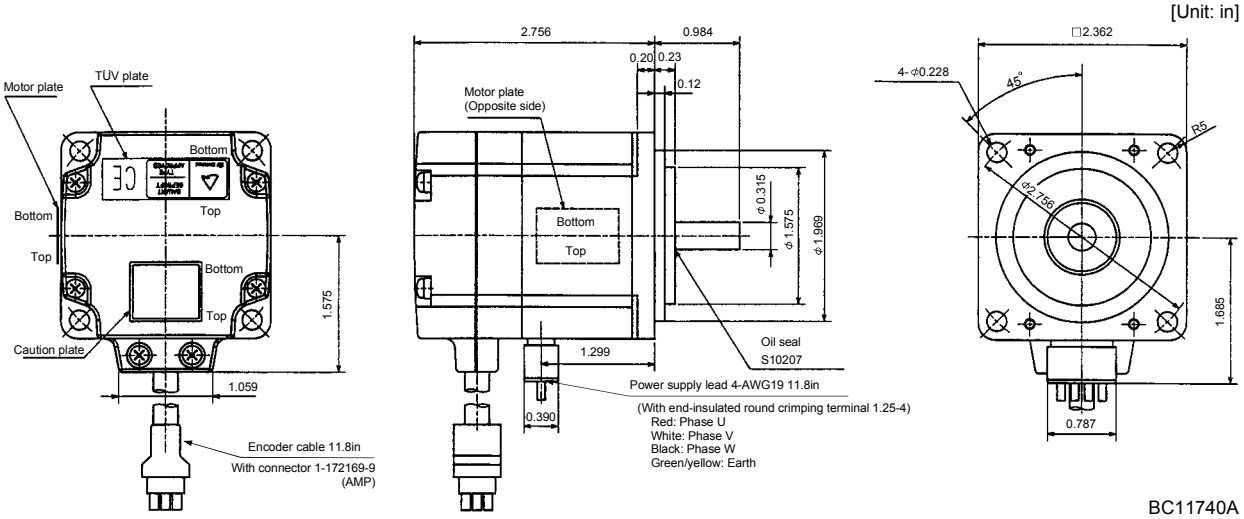
BC10647A
(BC12766*)

7.2.6 HC-UF 3000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-UF13	100	0.361	1.8

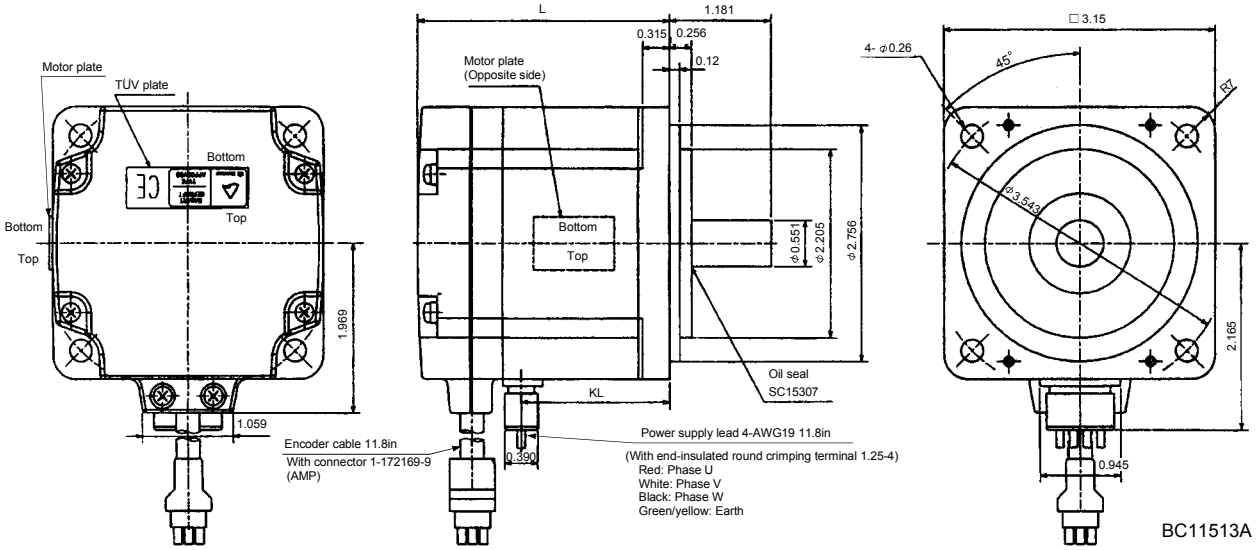
[Unit: in]



BC11740A

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz·in^2]	Mass [lb]
		L	KL		
HC-UF23	200	2.953	1.724	1.318	3.3
HC-UF43	400	3.543	2.315	1.996	3.7

[Unit: in]

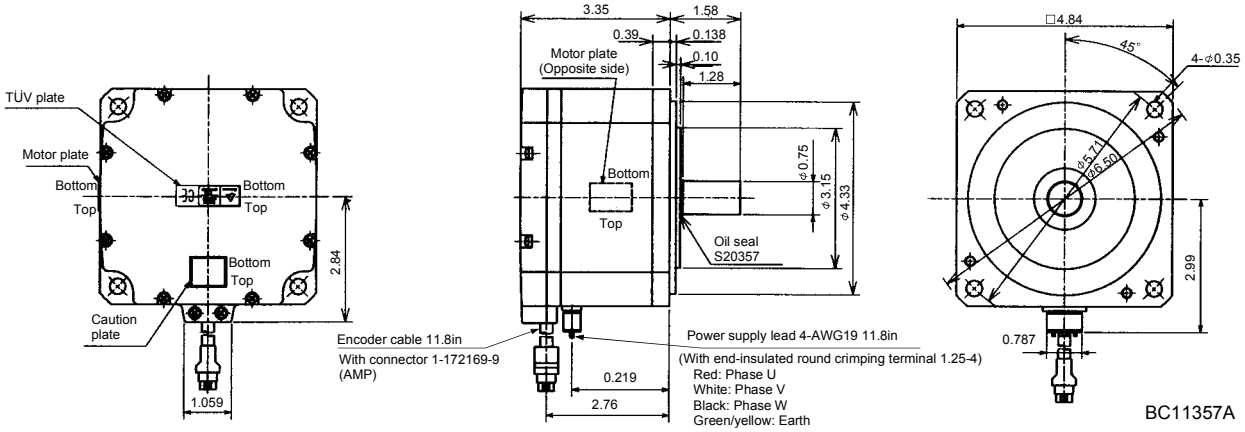


BC11513A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF73	750	32.258	11.0

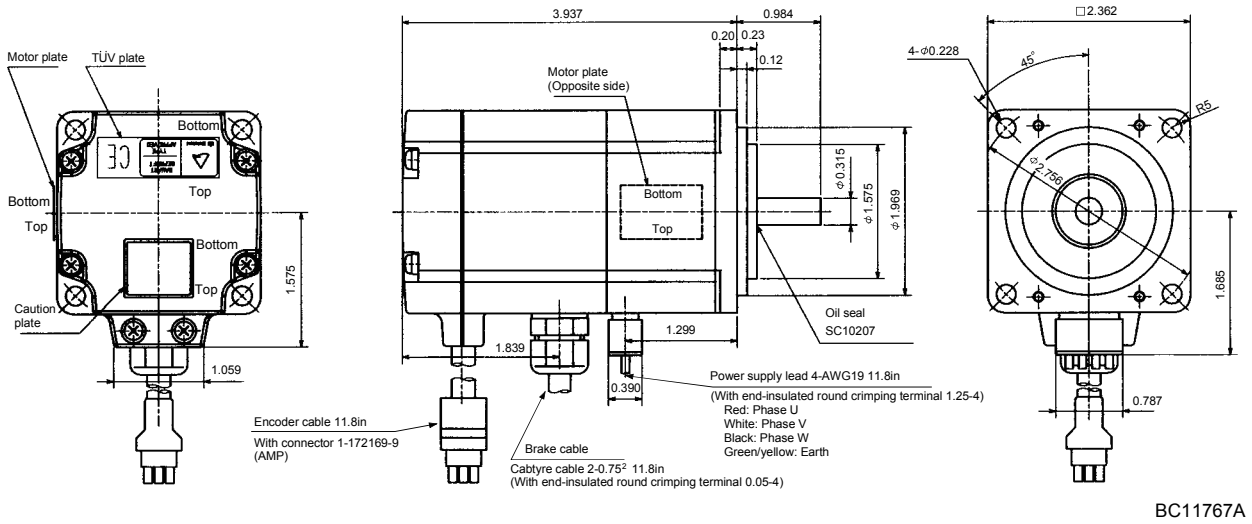
[Unit: in]



(2) With electromagnetic brake

Model	Output [W]	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF13B	100	45	0.405	2.6

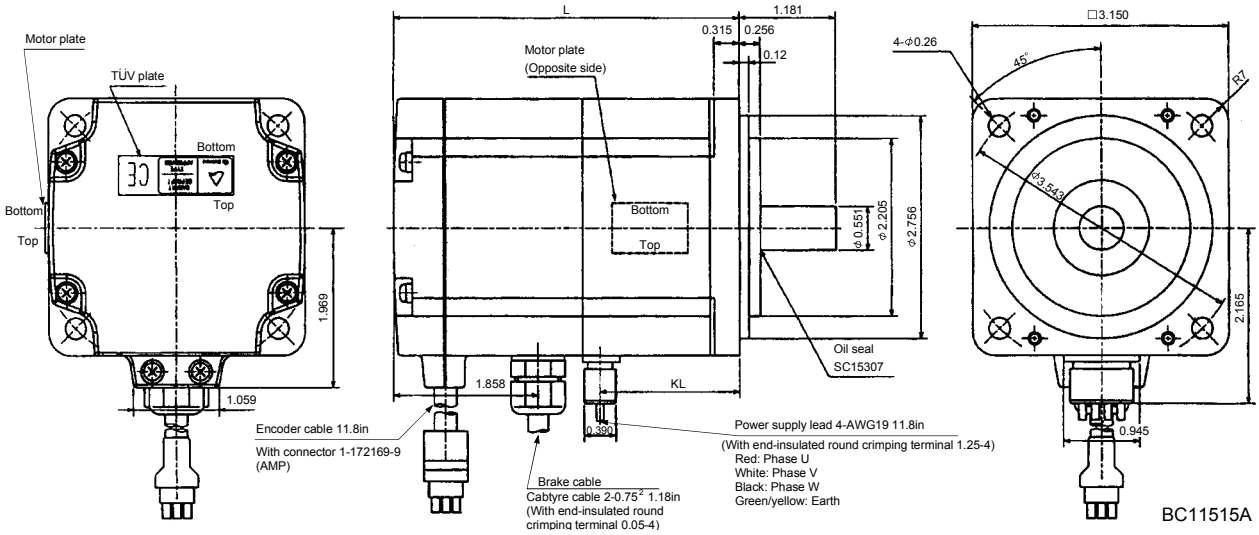
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

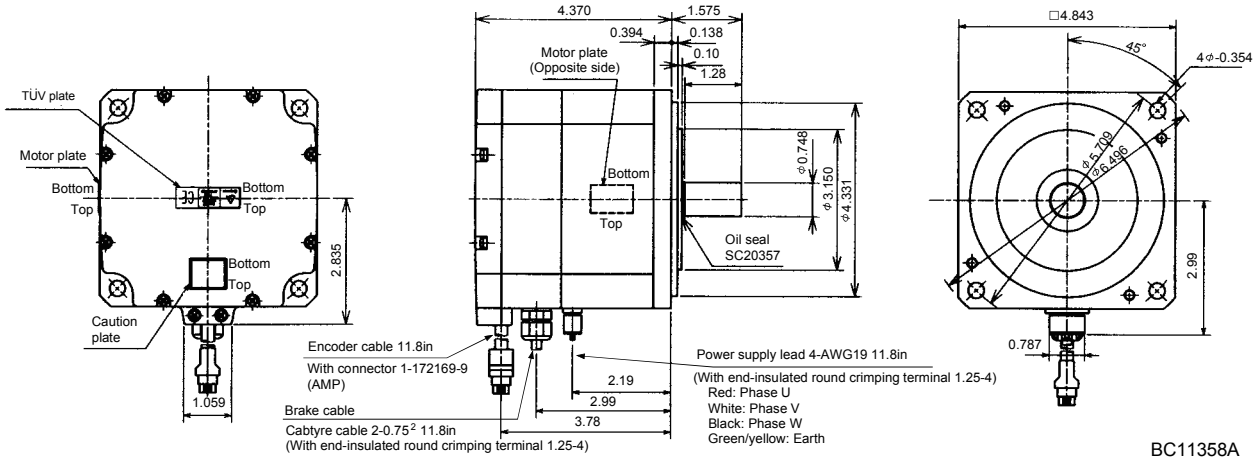
Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-UF23B	200	4.291	1.724	184	1.766	4.9
HC-UF43B	400	4.882	2.315	184	2.444	5.3

[Unit: in]



Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UF73B	750	339.87	33.35	13.7

[Unit: in]

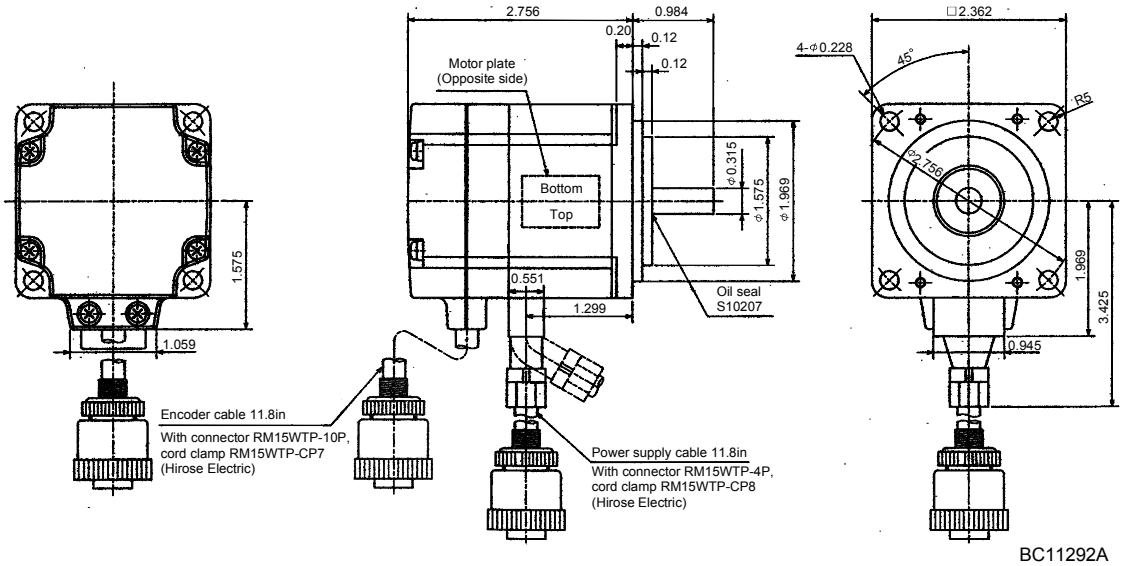


7.2.7 HC-UF3000r/min, HC-UFS3000r/min series with IP65-compliant connectors

(1) Without electromagnetic brake

Model		Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF13-S1	HC-UFS13-S1	100	0.361	1.8

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

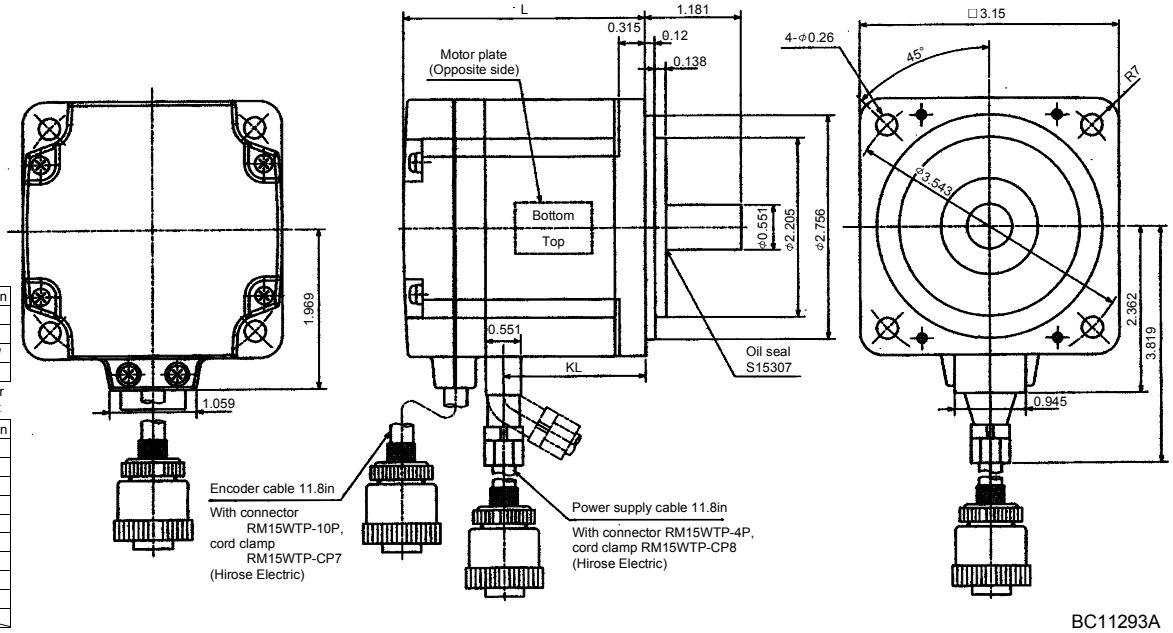
Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

BC11292A

Model		Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz・in^2]	Mass [lb]
			L	KL		
HC-UF23-S1	HC-UFS23-S1	200	0.2953	1.732	1.318	3.3
HC-UF43-S1	HC-UFS43-S1	400	3.543	2.323	1.996	3.7

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Encoder connector pin connection list

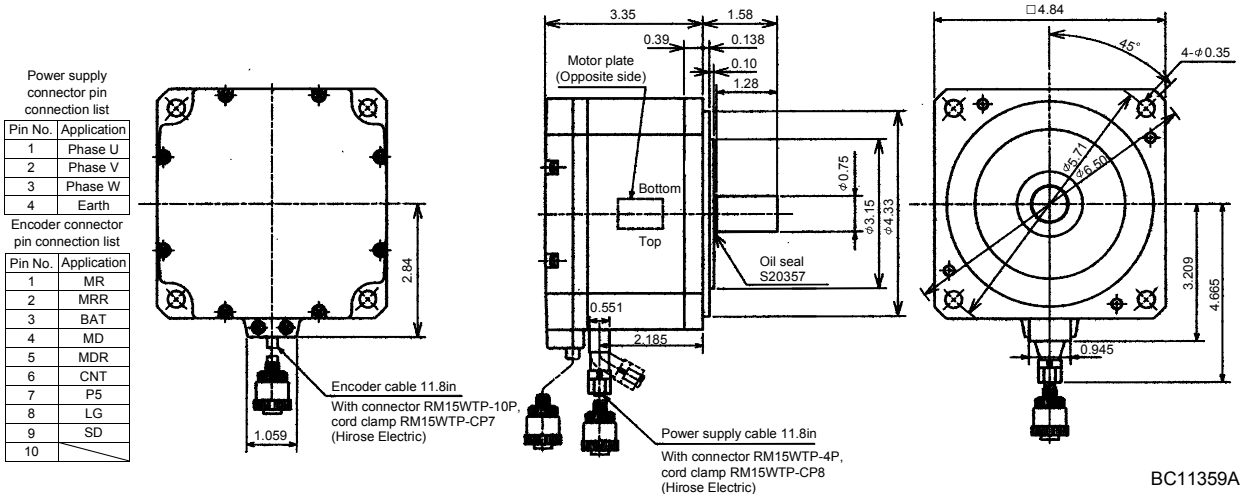
Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

BC11293A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF73-S1 HC-UFS73-S1	750	32.258	11.0

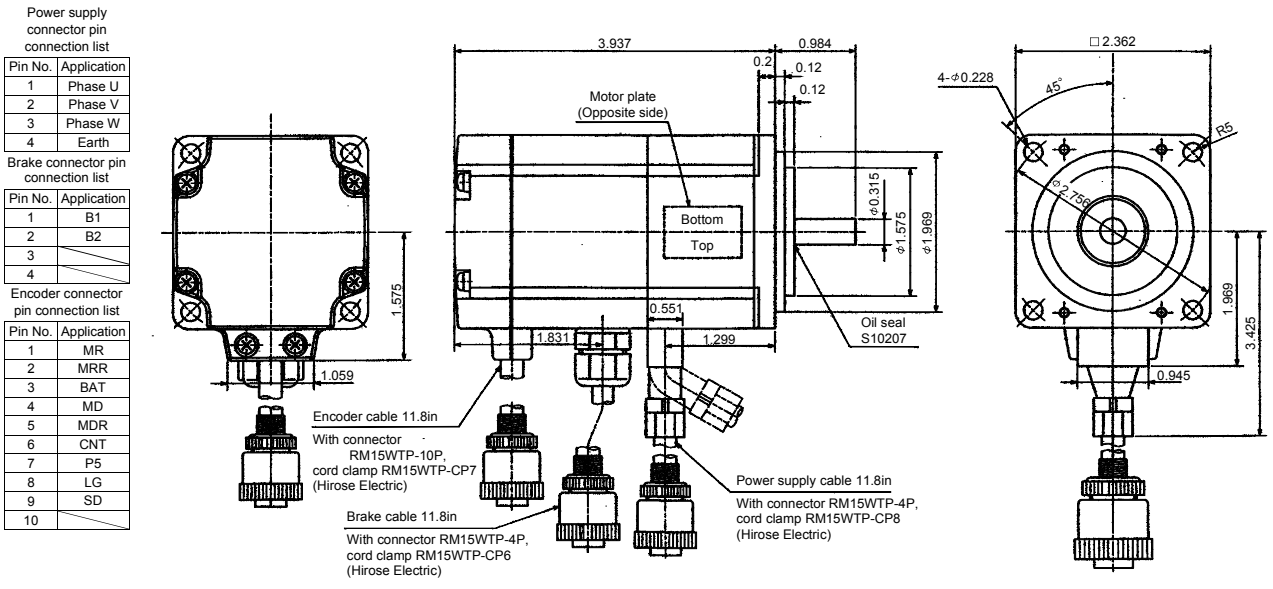
[Unit: in]



(2) With electromagnetic brake

Model	Output [W]	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-UF13B-S1 HC-UFS13B-S1	100	45	0.405	2.6

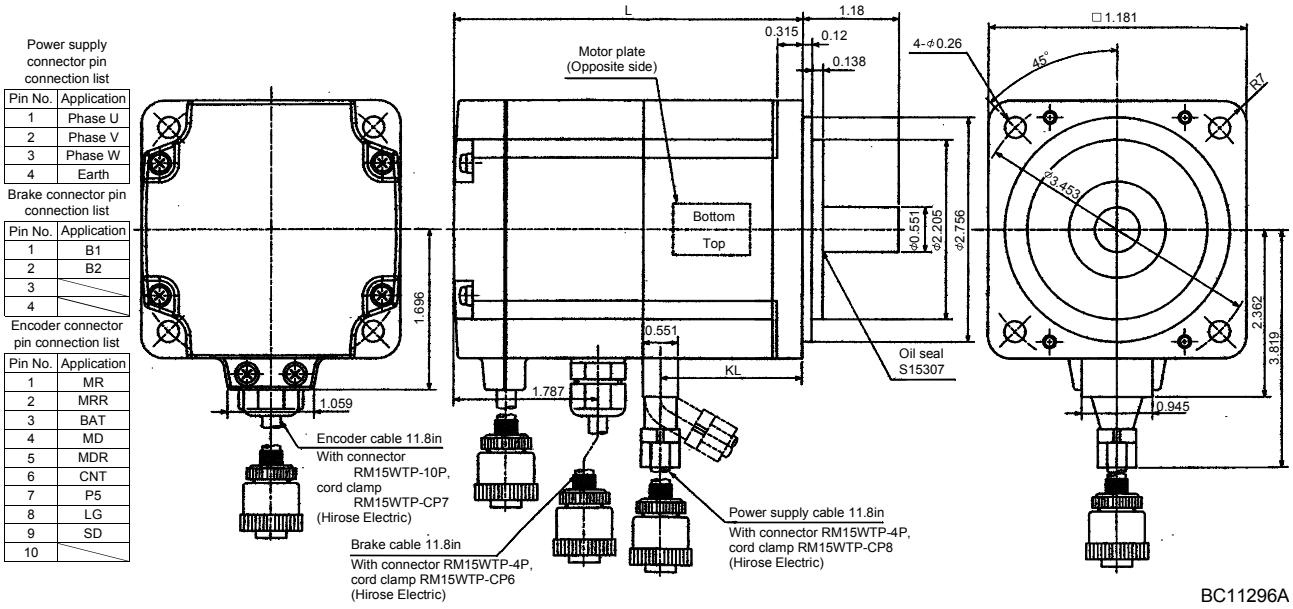
[Unit: in]



7. OUTLINE DIMENSION DRAWINGS

Model		Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
			L	KL			
HC-UF23B-S1	HC-UFS23B-S1	200	4.291	1.732	184	1.766	4.9
HC-UF43B-S1	HC-UFS43B-S1	400	4.882	2.323	184	2.444	5.3

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Brake connector pin connection list

Pin No.	Application
1	B1
2	B2
3	
4	

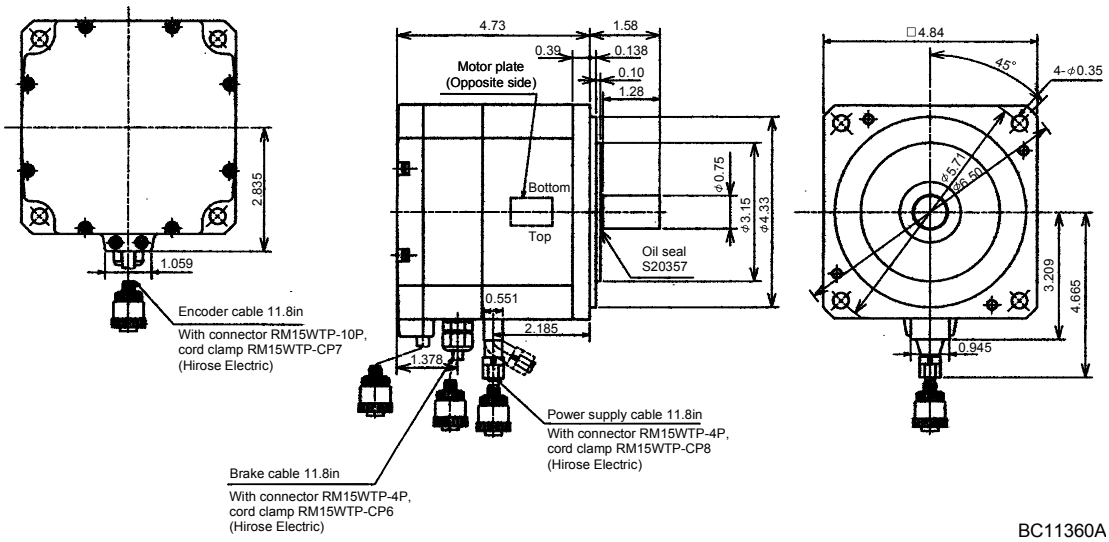
Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

BC11296A

Model		Output [W]	Brake static friction torque [oz ▪ in]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HC-UF73B-S1	HC-UFS73B-S1	750	339.869	33.351	13.7

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

Brake connector pin connection list

Pin No.	Application
1	B1
2	B2
3	
4	

Encoder connector pin connection list

Pin No.	Application
1	MR
2	MRR
3	BAT
4	MD
5	MDR
6	CNT
7	P5
8	LG
9	SD
10	

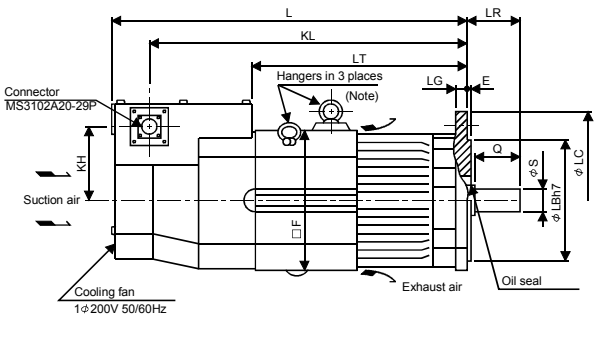
BC11360A

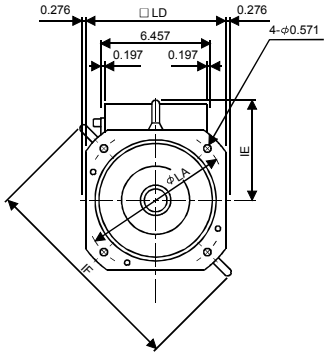
7.2.8 HA-LH series

(1) Standard (without electromagnetic brake)

Model	Variable Dimensions [in]																	Inertia Moment WK^2 [oz • in^2]	Oil Seal	Mass [lb]
	F	L	LA	LB	LC	□LD	LG	LT	KL	KH	IE	IF	Hanger	E	LR	Q	S			
HA-LH11K2(-Y)	8.189	20.827	8.465	7.087	9.843	8.031	0.787	12.441	18.819	4.016	5.984	12.48	M10	0.118	3.346	3.15	1.654	645.16	S45629B	46.30
HA-LH15K2(-Y)	10	22.756	10.433	9.055	11.811	9.843	0.984	14.252	20.948	4.606	7.087	14.803	M12	0.197	4.331	3.937	2.165	1585.56	S608295	37.48
HA-LH22K2(-Y)		25.315						16.929	23.307									2159.64		66.14

[Unit: in]

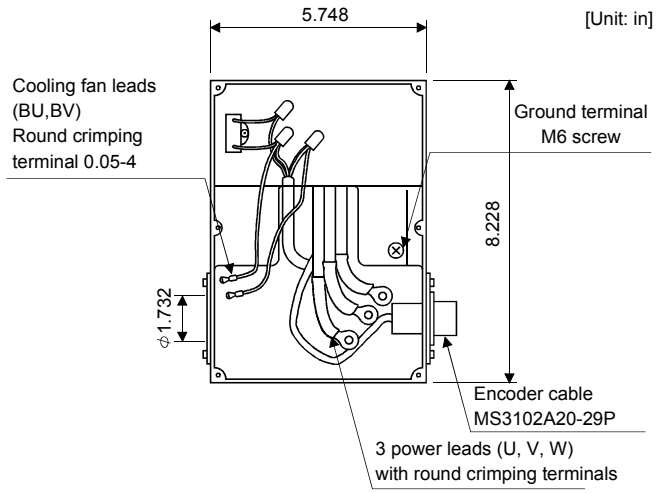




Note: When using the motor without the hangers, plug the screw holes with the following bolts:
HA-LH11K2: M10 × 0.591in max.
HA-LH15K2, 22K2: M12 × 0.709in max.

Terminal Box of HA-LH11K2 to 22K2

[Unit: in]



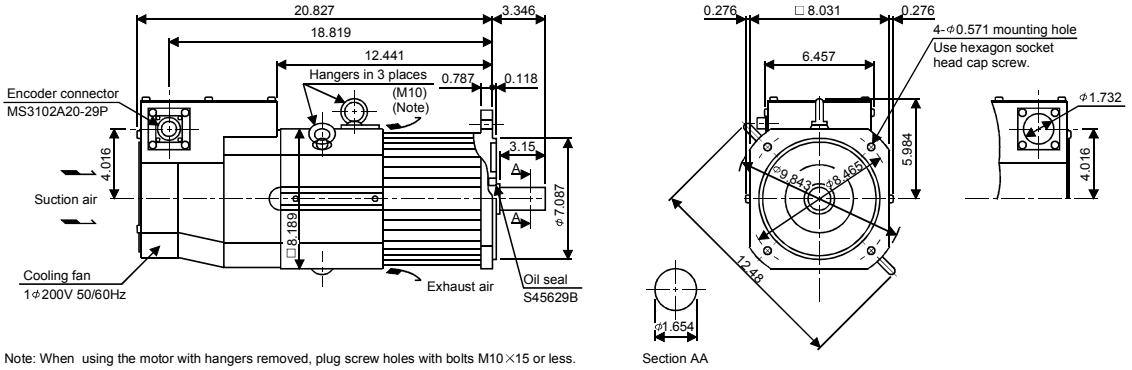
Power Connection Screw Size

Servo Motor	Power Connection Screw Size
HA-LH11K2	8-6
HA-LH15K2 • 22K2	14-6

(2) EN・UL/C-UL Standard-Compliant model

Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LH11K2-EC	11	642.425	154.3

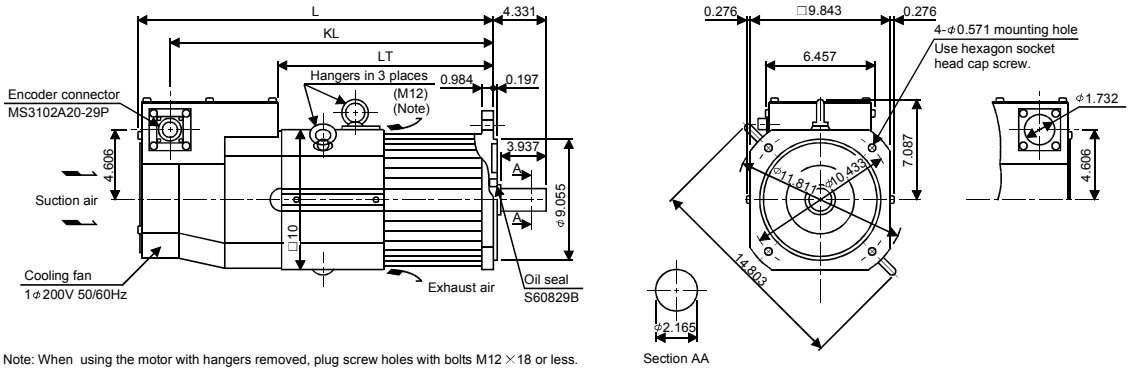
[Unit: in]



Note: When using the motor with hangers removed, plug screw holes with bolts M10×15 or less.

Model	Output [W]	Variable Dimensions [in]			Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL	LT		
HA-LH15K2-EC	15	22.756	20.748	14.252	1585.559	238.1
HA-LH22K2-EC	22	25.315	23.307	16.929	2159.641	297.6

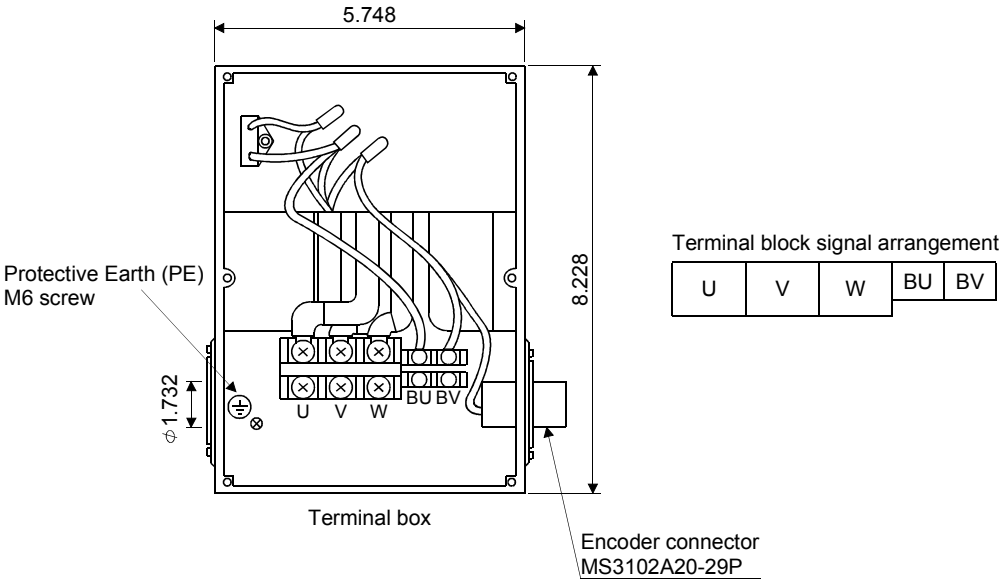
[Unit: in]



Note: When using the motor with hangers removed, plug screw holes with bolts M12×18 or less.

Terminal Box of HA-LH11K2-EC to 22K2-EC

[Unit: in]



Terminal block signal arrangement

U	V	W	BU	BV

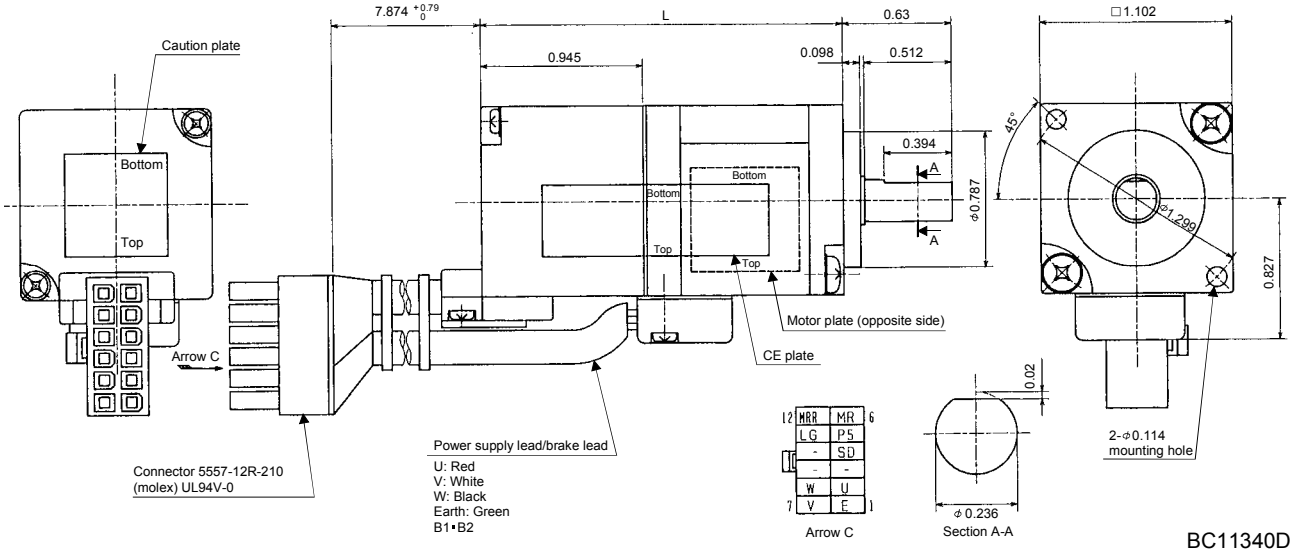
Model	Power Connection Screw Size	Cooling fan Connection Screw Size
HA-LH11K2-EC	M6	M4
HA-LH15K2-EC・22K2-EC	M8	M4

7.2.9 HC-AQ series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Variable Dimensions [in] L	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-AQ0135D	10	2.126	0.027	0.419
HC-AQ0235D	20	2.402	0.039	0.485
HC-AQ0335D	30	2.677	0.051	0.551

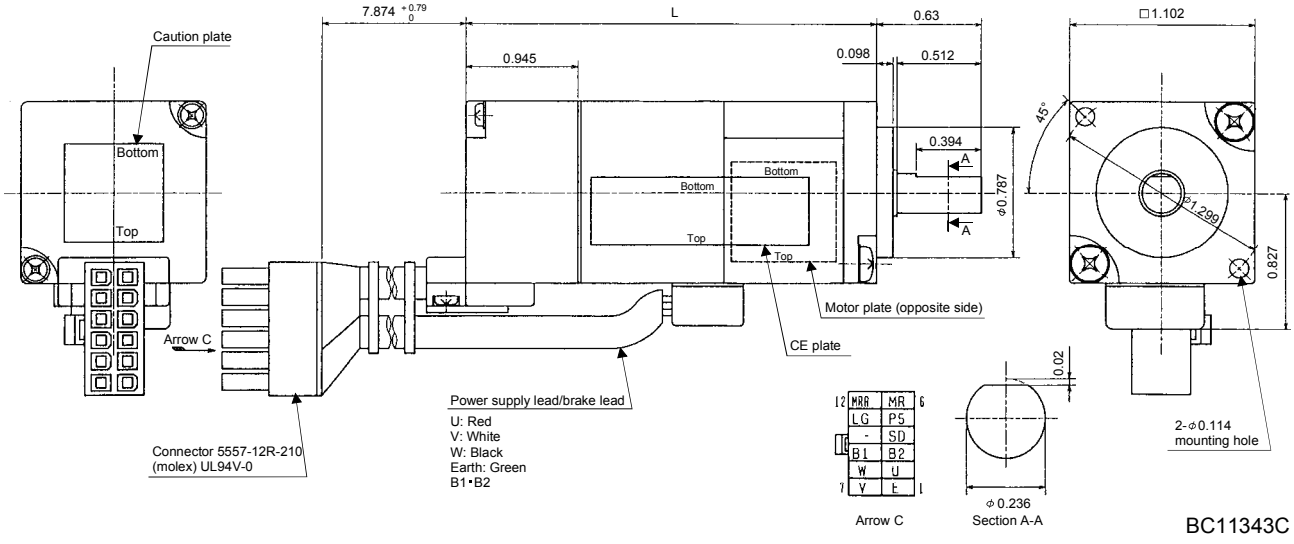
[Unit: in]



(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in] L	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-AQ0135BD	10	3.189	0.05	0.639
HC-AQ0235BD	20	3.465	0.062	0.705
HC-AQ0335BD	30	3.74	0.074	0.772

[Unit: in]

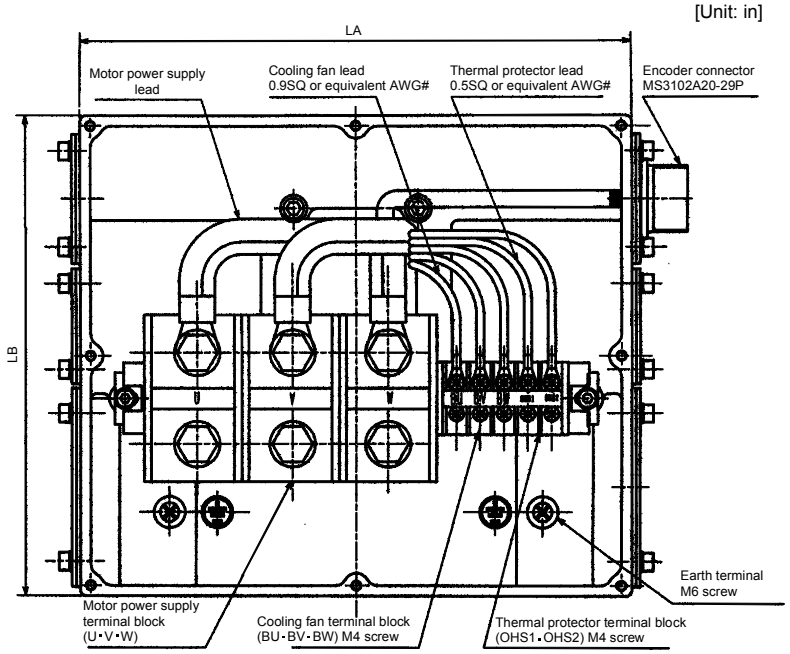


7.2.10 HA-LF series

Terminal box detail diagram

Motor Model		HA-LF30K2 HA-LF37K2 HA-LF30K24 HA-LF37K24	HA-LF45K24 HA-LF55K24
Motor power supply lead size		0.0124in² (AWG8) ×2 parallel	0.0341in² (AWG4) ×2 parallel
Motor power supply terminal block screw size		M8	M10
Terminal box dimensions (in)	LA	8.661	10.472
	LB	8.268	9.055

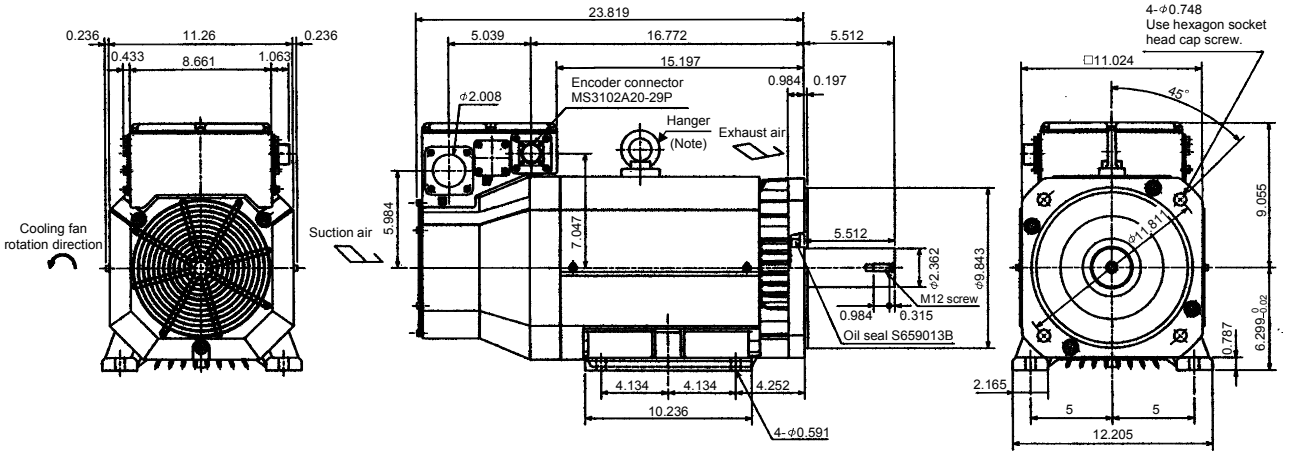
[Unit: in]



BG71994C

Model	Output [kW]	Inertia Moment WK²[oz・in²]	Mass [lb]
HA-LF30K24	30	3007.095	352.739

[Unit: in]



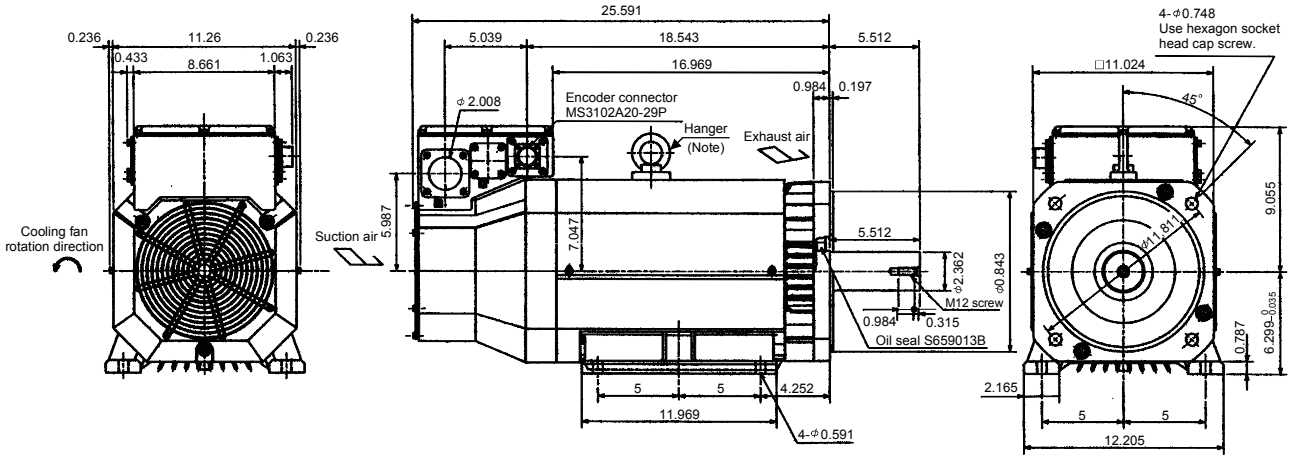
Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10833

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LF37K24	37	3553.84	396.832

[Unit: in]

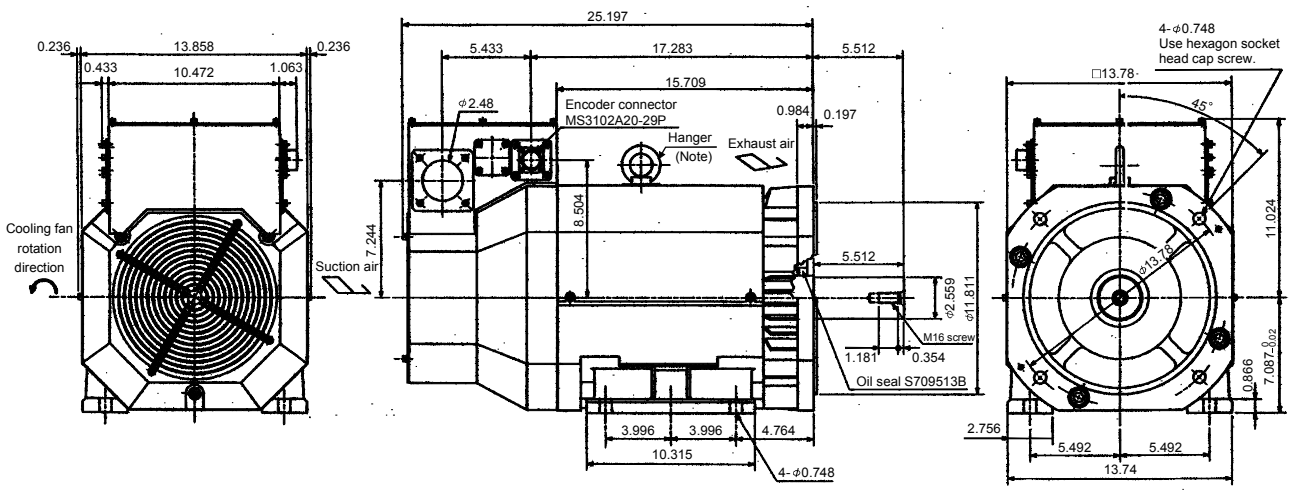


Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10788C

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LF45K24	45	5904.841	507.063

[Unit: in]



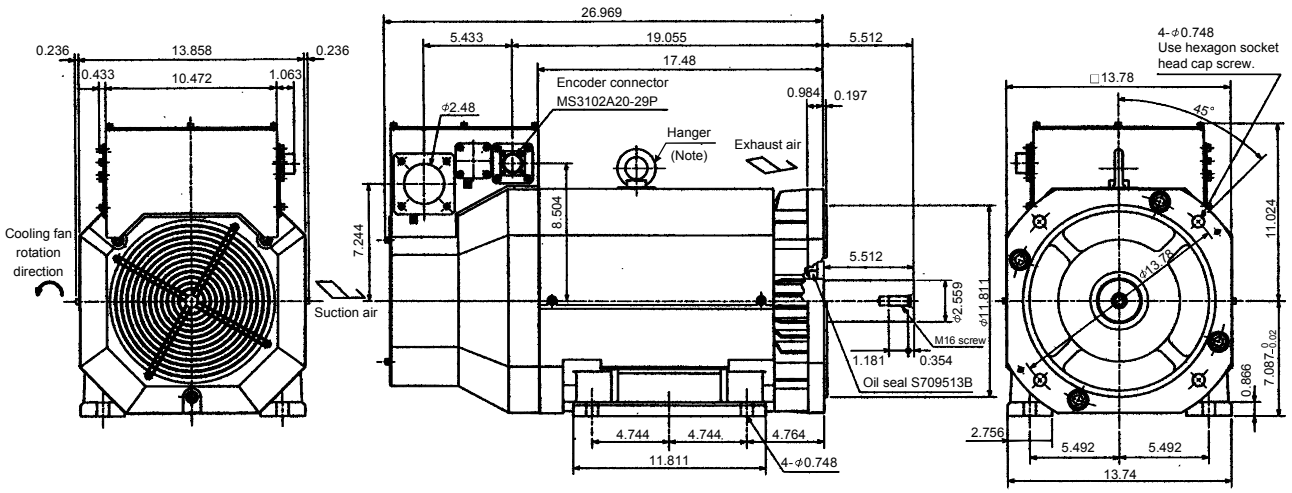
Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC11107A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HA-LF55K24	55	7162.354	551.155

[Unit: in]

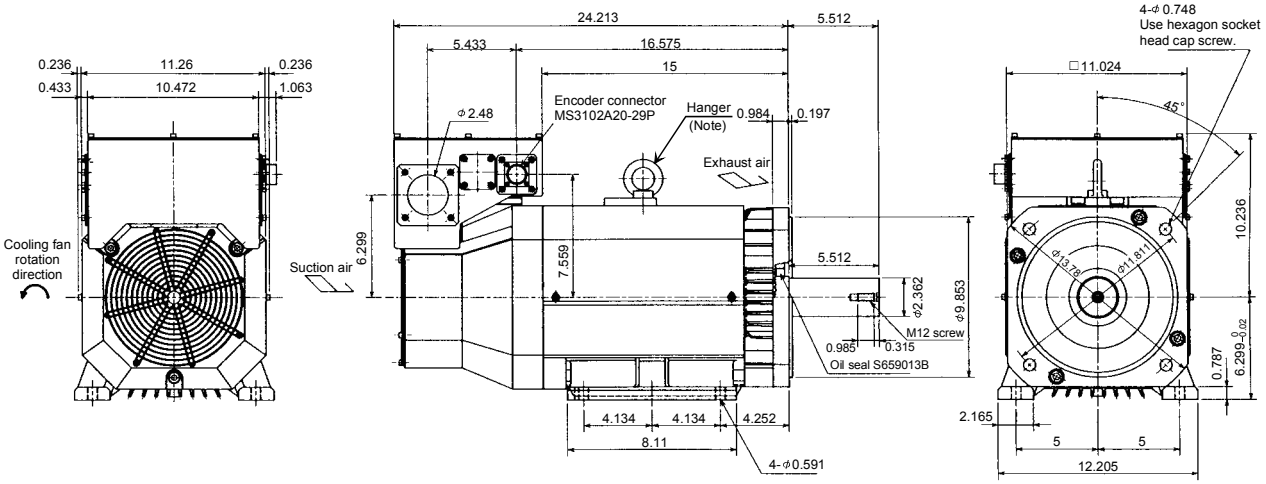


Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC10522F

Model	Output [kW]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HA-LF30K2	30	3007.095	352.739

[Unit: in]



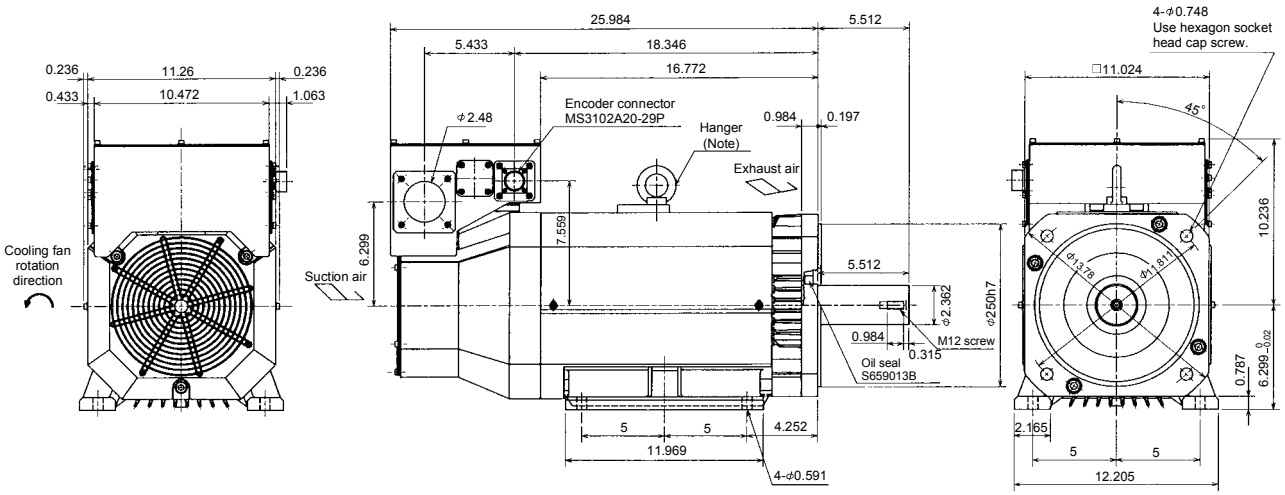
Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16×20mm or less.

BC12180*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
HA-LF37K2	37	3553.8	396.8

[Unit: in]



Note: When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20mm or less.

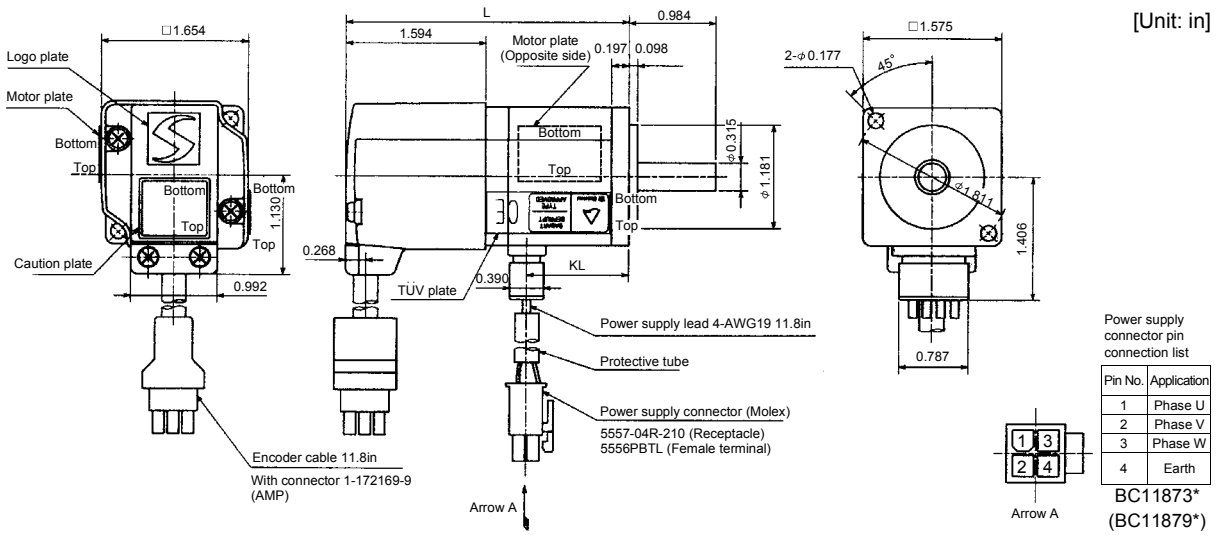
BC12181*

7.2.11 HC-MFS • HC-KFS series

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL		
HC-MFS053	50	3.21	1.16	0.10	0.9
HC-MFS13	100	3.80	0.18	0.16	1.2
HC-KFS053	50	3.21	0.12	0.29	0.9
HC-KFS13	100	3.80	1.75	0.46	1.2

[Unit: in]



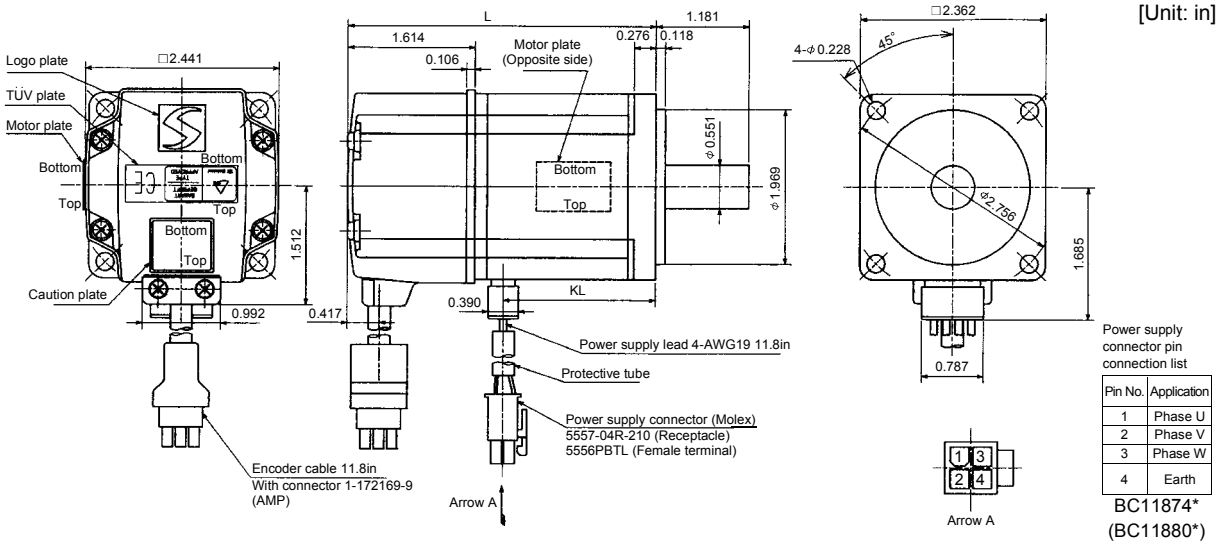
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11873*
(BC11879*)

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL		
HC-MFS23	200	3.92	1.93	0.48	2.2
HC-MFS43	400	4.90	0.06	0.78	3.2
HC-KFS23	200	3.92	1.93	2.30	2.2
HC-KFS43	400	4.90	0.06	3.66	3.2

[Unit: in]



Power supply connector pin connection list

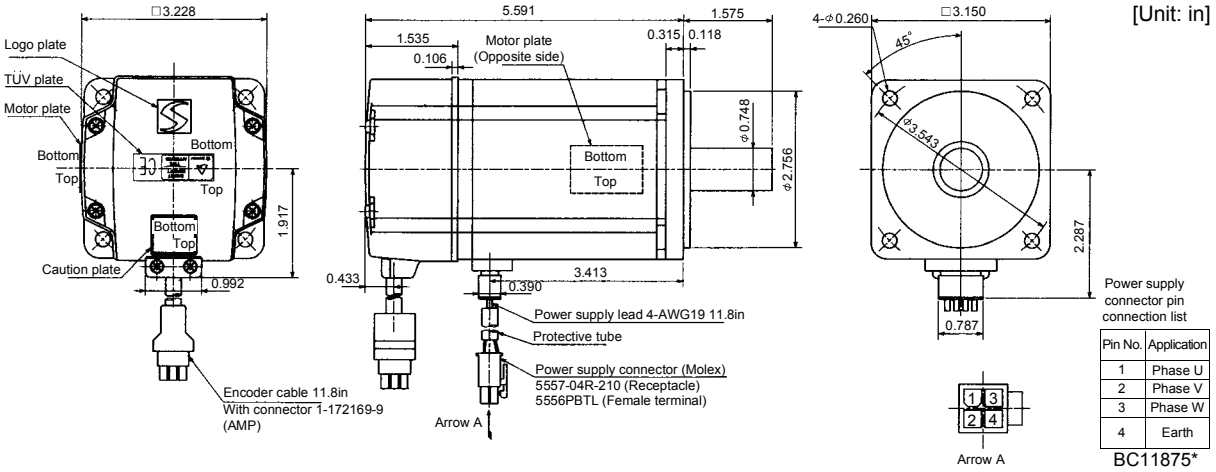
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11874*
(BC11880*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS73	750	3.28	6.6
HC-KFS73	750	8.256	6.6

[Unit: in]

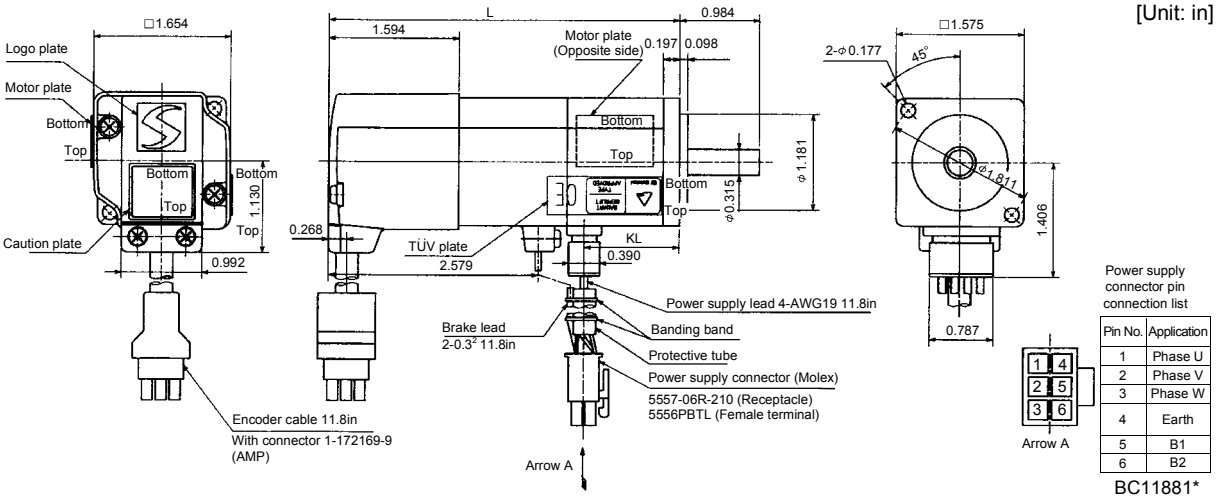


BC11875*
(BC12580*)

(2) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
		L	KL			
HC-MFS053B	50	4.31	1.16	45.32	0.12	1.7
HC-MFS13B	100	4.90	1.75	45.32	0.18	2.0
HC-KFS053B	50	4.31	1.16	45.32	0.31	1.7
HC-KFS13B	100	4.90	1.75	45.32	0.48	2.0

[Unit: in]

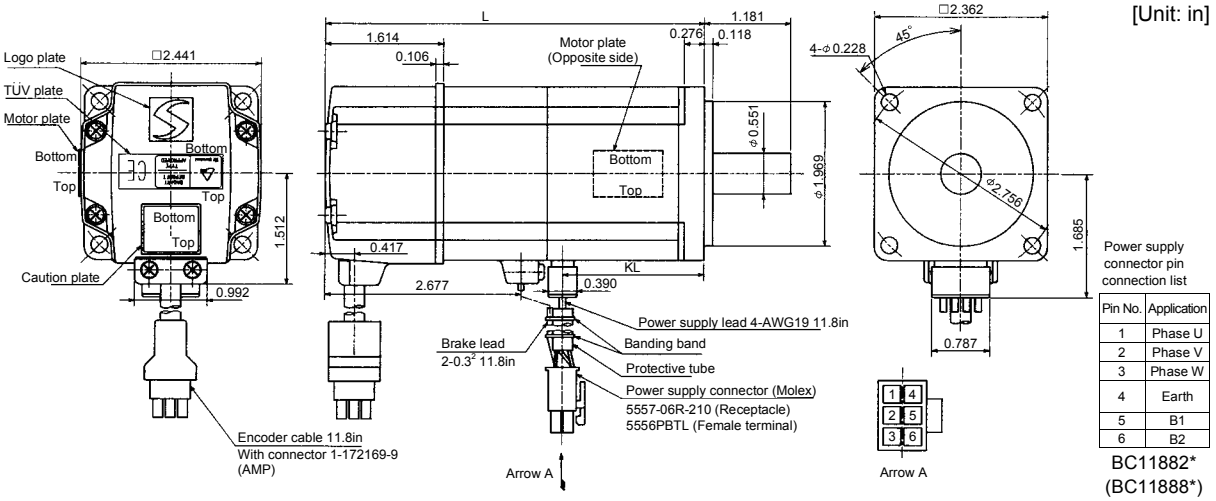


BC11881*
(BC11887*)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-MFS23B	200	5.18	1.93	184	0.74	3.5
HC-MFS43B	400	6.16	2.84	184	1.04	4.6
HC-KFS23B	200	5.18	1.93	184	1.694	3.5
HC-KFS43B	400	6.16	2.84	184	2.788	4.6

[Unit: in]



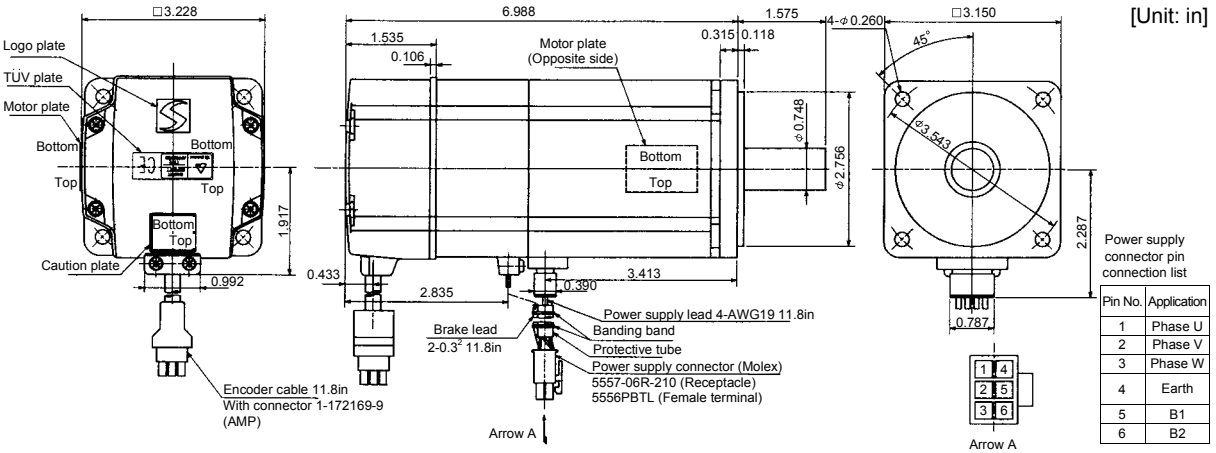
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11882*
(BC11888*)

Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-MFS73B	750	340	3.96	8.8
HC-KFS73B	750	340	8.94	8.8

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11883*
(BC12581*)

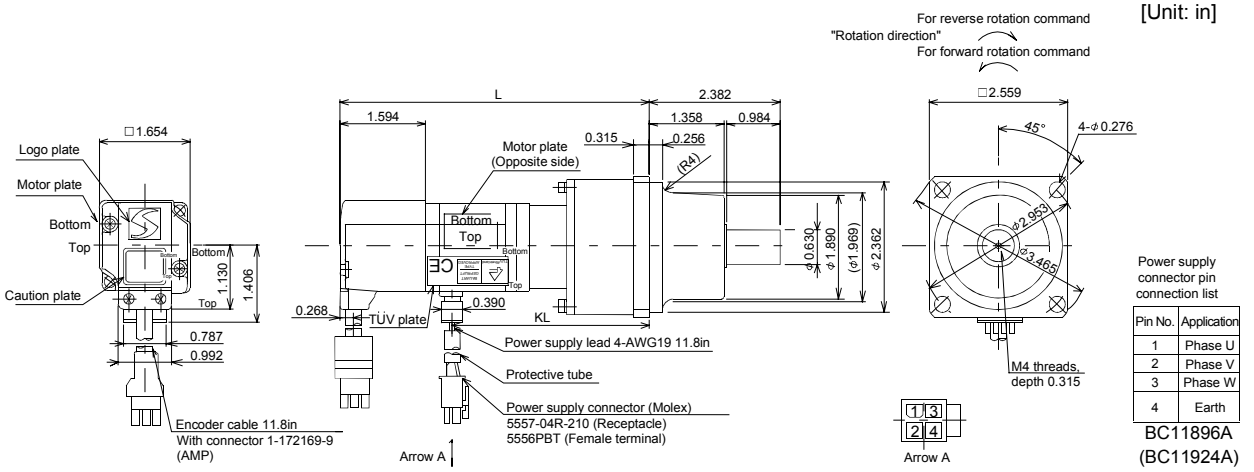
(3) With reduction gear for general industrial machine

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HC-MFS053G1	50	4.96	2.91	K6505	1/5(9/44)	0.30	60min. max.	3.1
HC-MFS053G1	50	5.669	3.62	K6512	1/12(49/576)	0.42	60min. max.	4.0
HC-MFS053G1	50	5.669	3.62	K6520	1/20(25/484)	0.32	60min. max.	4.0
HC-KFS053G1	50	4.96	2.91	K6505	1/5(9/44)	0.49	60min. max.	3.1
HC-KFS053G1	50	5.669	3.62	K6512	1/12(49/576)	0.61	60min. max.	4.0
HC-KFS053G1	50	5.669	3.62	K6520	1/20(25/484)	0.51	60min. max.	4.0

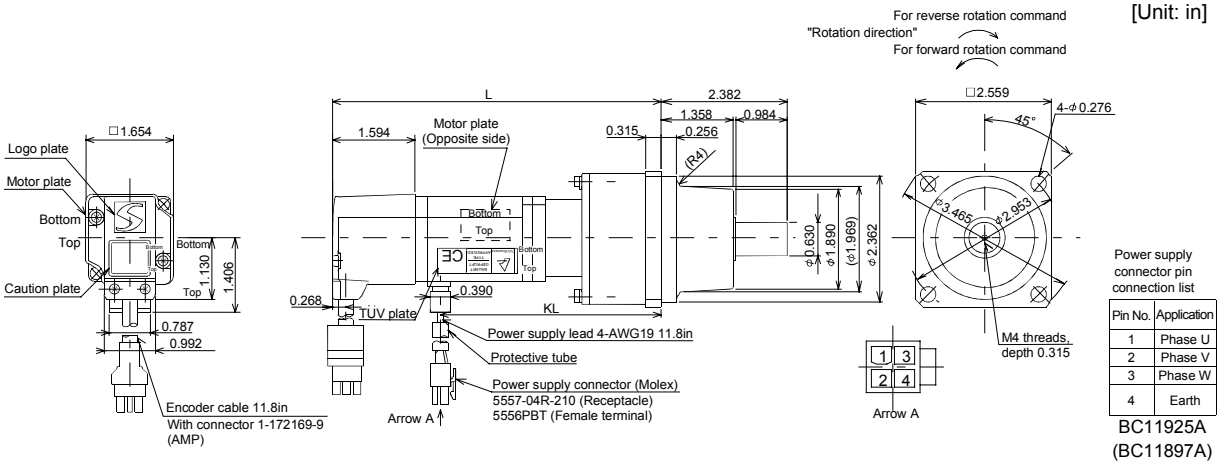
[Unit: in]



BC11896A
(BC11924A)

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HC-MFS13G1	100	5.551	3.5	K6505	1/5(9/44)	0.36	60min. max.	3.31
HC-MFS13G1	100	6.26	4.21	K6512	1/12(49/576)	0.48	60min. max.	4.19
HC-MFS13G1	100	6.26	4.21	K6520	1/20(25/484)	0.38	60min. max.	4.19
HC-KFS13G1	100	5.551	3.5	K6505	1/5(9/44)	0.66	60min. max.	3.31
HC-KFS13G1	100	6.26	4.21	K6512	1/12(49/576)	0.78	60min. max.	4.19
HC-KFS13G1	100	6.26	4.21	K6520	1/20(25/484)	0.68	60min. max.	4.19

[Unit: in]

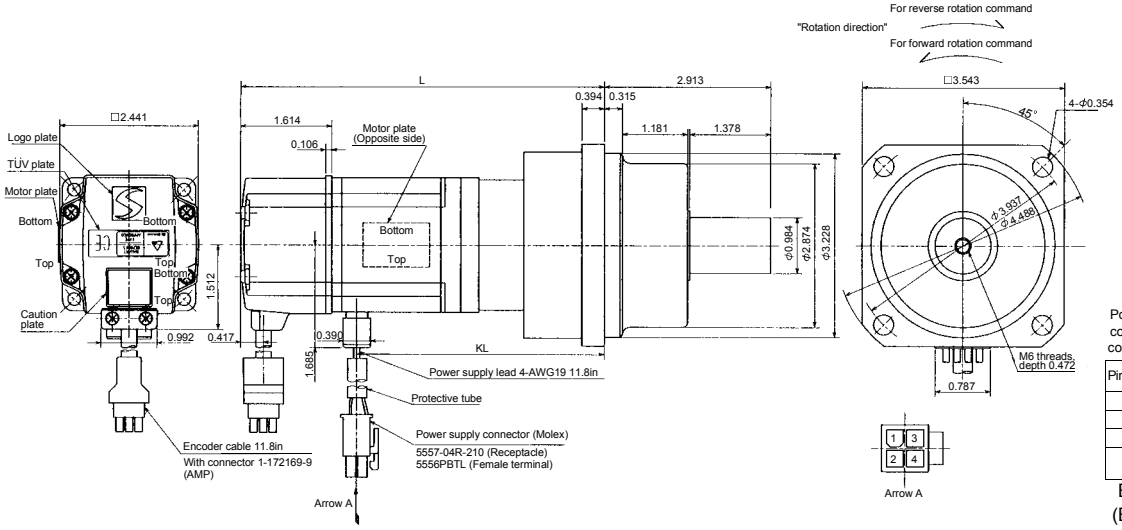


BC11925A
(BC11897A)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS23G1	200	6.02	4.04	K9005	1/5(19/96)	1.36	7.3
HC-MFS23G1	200	6.81	4.83	K9012	1/12(25/288)	1.60	8.6
HC-MFS23G1	200	6.81	4.83	K9020	1/20(253/5000)	1.45	8.6
HC-KFS23G1	200	6.02	4.04	K9005	1/5(19/96)	2.296	7.3
HC-KFS23G1	200	6.81	4.83	K9012	1/12(25/288)	2.569	8.6
HC-KFS23G1	200	6.81	4.83	K9020	1/20(253/5000)	2.406	8.6

[Unit: in]



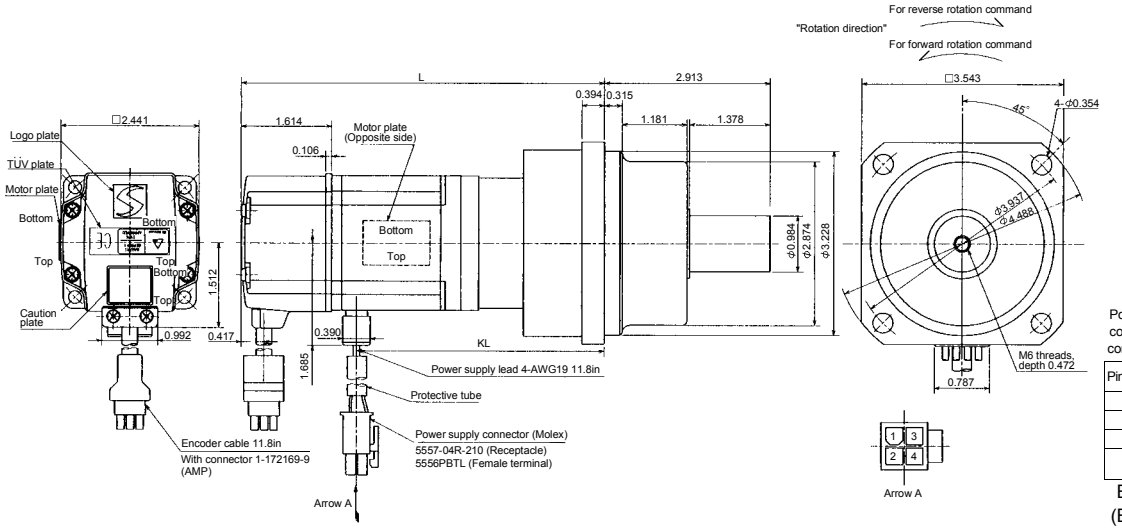
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11898*
(BC11926*)

Model	Output [W]	Variable Dimensions [in] L	Variable Dimensions [in] KL	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS43G1	400	7.01	4.95	K9005	1/5(19/96)	1.62	8.4
HC-MFS43G1	400	7.80	5.73	K9012	1/12(25/288)	1.85	9.7
HC-KFS43G1	400	7.01	4.95	K9005	1/5(19/96)	3.335	8.4
HC-KFS43G1	400	7.80	5.73	K9012	1/12(25/288)	3.609	9.7

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11899*
(BC11927*)

7. OUTLINE DIMENSION DRAWINGS

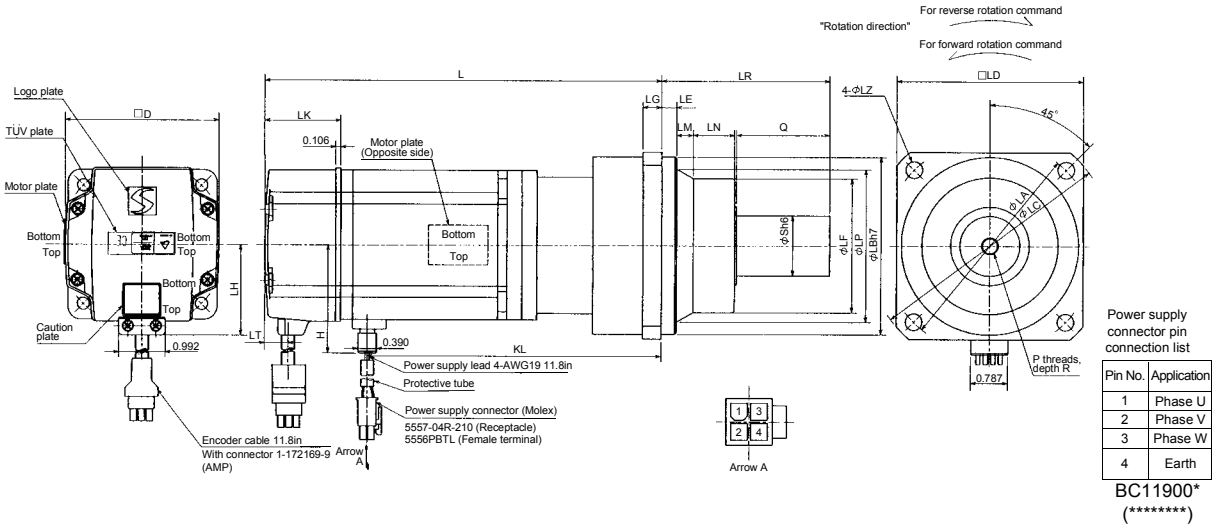
Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-MFS43G1	400	K10020	1/20	253/5000	3.57	60min. max.	12.13
HC-MFS73G1	750	K10005	1/5	1/5	5.58	60min. max.	13.67
HC-MFS73G1	750	K10012	1/12	525/6048	9.22	60min. max.	16.09
HC-MFS73G1	750	K12020	1/20	625/12544	9.57	60min. max.	22.27

Model	Output [W]	Variable Dimensions [in]																					
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MFS43G1	400	2.362	1.50	1.61	0.42	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	7.933	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-MFS73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	8.15	3.54	5.97	0.35	1.97	1.26	M8	0.63
HC-MFS73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.016	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-MFS73G1	750	3.15	1.89	1.54	0.43	2.29	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	9.528	4.17	7.35	0.55	2.36	1.57	M10	0.79

Model	Output [W]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
			Normal Reduction ratio	Actual Reduction Ratio			
HC-KFS43G1	400	K10020	1/20	253/5000	5.303	60min. max.	12.13
HC-KFS73G1	750	K10005	1/5	1/5	10.55	60min. max.	13.67
HC-KFS73G1	750	K10012	1/12	525/6048	14.19	60min. max.	16.09
HC-KFS73G1	750	K12020	1/20	625/12544	14.54	60min. max.	22.27

Model	Output [W]	Variable Dimensions [in]																					
		D	LH	LK	LT	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-KFS43G1	400	2.362	1.50	1.61	0.42	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	7.933	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-KFS73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	8.15	3.54	5.97	0.35	1.97	1.26	M8	0.63
HC-KFS73G1	750	3.15	1.89	1.54	0.43	2.29	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.016	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-KFS73G1	750	3.15	1.89	1.54	0.43	2.29	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	9.528	4.17	7.35	0.55	2.36	1.57	M10	0.79

[Unit: in]



Power supply connector pin connection list

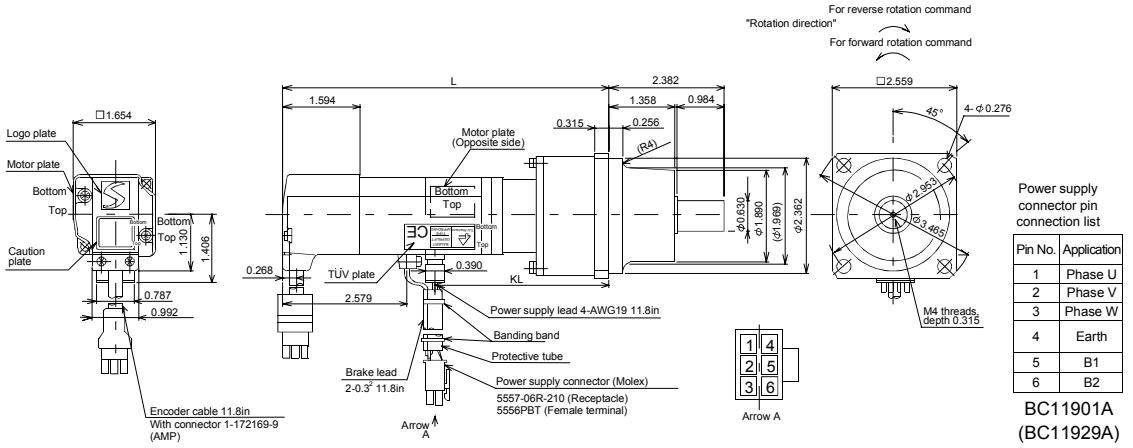
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11900*
(********)

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL						
HC-MFS053BG1	50	6.06	2.91	45	K6505	1/5(9/44)	0.32	60min. max.	4.0
HC-MFS053BG1	50	6.77	3.62	45	K6512	1/12(49/576)	0.44	60min. max.	4.9
HC-MFS053BG1	50	6.77	3.62	45	K6520	1/20(25/484)	0.34	60min. max.	4.9
HC-KFS053BG1	50	6.02	2.91	45	K6505	1/5(9/44)	0.51	60min. max.	4.0
HC-KFS053BG1	50	6.77	3.62	45	K6512	1/12(49/576)	0.63	60min. max.	4.9
HC-KFS053BG1	50	6.77	3.62	45	K6520	1/20(25/484)	0.53	60min. max.	4.9

[Unit: in]



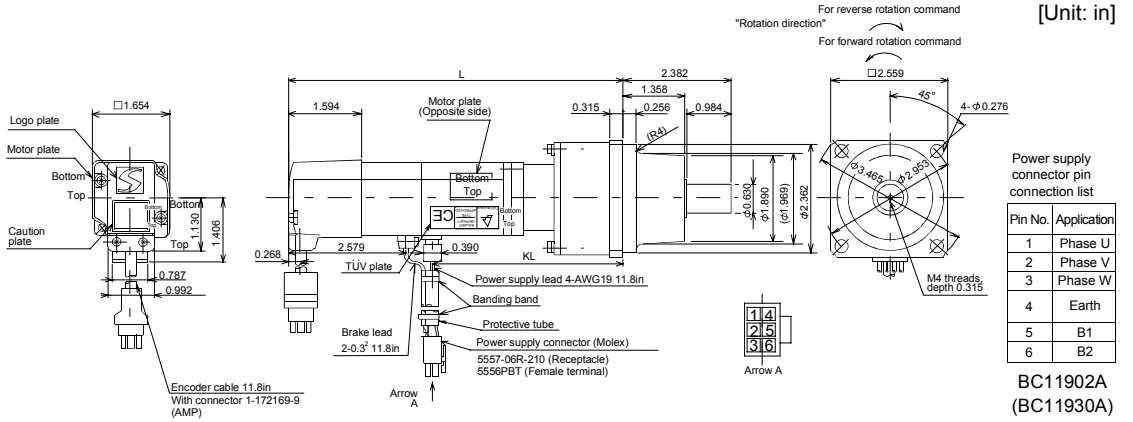
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11901A
(BC11929A)

Model	Output [W]	Variable Dimensions (in)		Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
		L	KL						
HC-MFS13BG1	100	6.65	3.43	45	K6505	1/5(9/44)	0.38	60min. max.	4.2
HC-MFS13BG1	100	7.36	4.21	45	K6512	1/12(49/576)	0.50	60min. max.	5.1
HC-MFS13BG1	100	7.36	4.21	45	K6520	1/20(25/484)	0.40	60min. max.	5.1
HC-KFS13BG1	100	6.65	3.43	45	K6505	1/5(9/44)	0.68	60min. max.	4.2
HC-KFS13BG1	100	7.36	4.21	45	K6512	1/12(49/576)	0.80	60min. max.	5.1
HC-KFS13BG1	100	7.36	4.21	45	K6520	1/20(25/484)	0.7	60min. max.	5.1

[Unit: in]



Power supply connector pin connection list

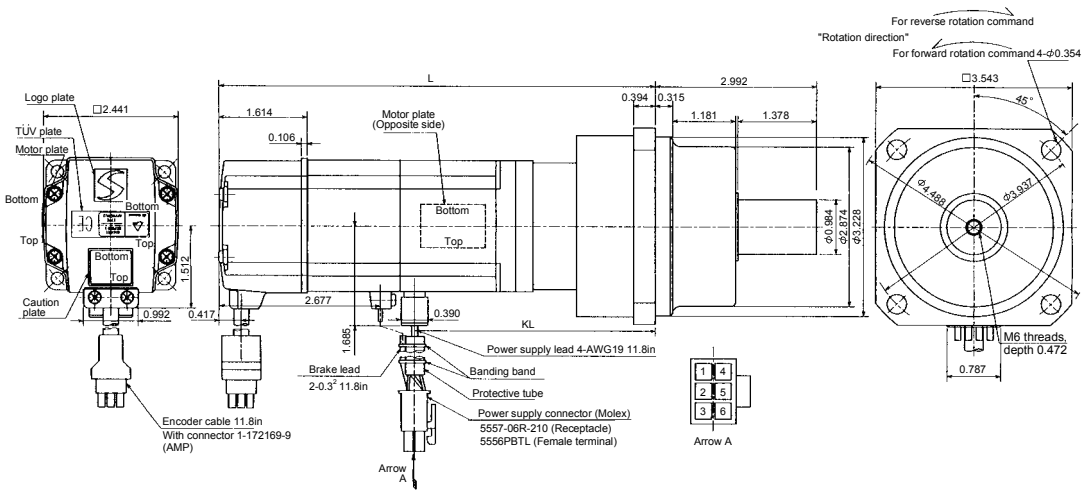
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11902A
(BC11930A)

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL					
HC-MFS23BG1	200	6.65	4.04	184	K9005	1/5(19/96)	1.58	8.6
HC-MFS23BG1	200	7.36	4.23	184	K9012	1/12(25/288)	1.82	9.9
HC-MFS23BG1	200	7.36	4.23	184	K9020	1/20(253/5000)	1.67	9.9
HC-KFS23BG1	200	6.65	4.04	184	K9005	1/5(19/96)	2.569	8.6
HC-KFS23BG1	200	7.36	4.23	184	K9012	1/12(25/288)	2.843	9.9
HC-KFS23BG1	200	7.36	4.23	184	K9020	1/20(253/5000)	2.679	9.9

[Unit: in]



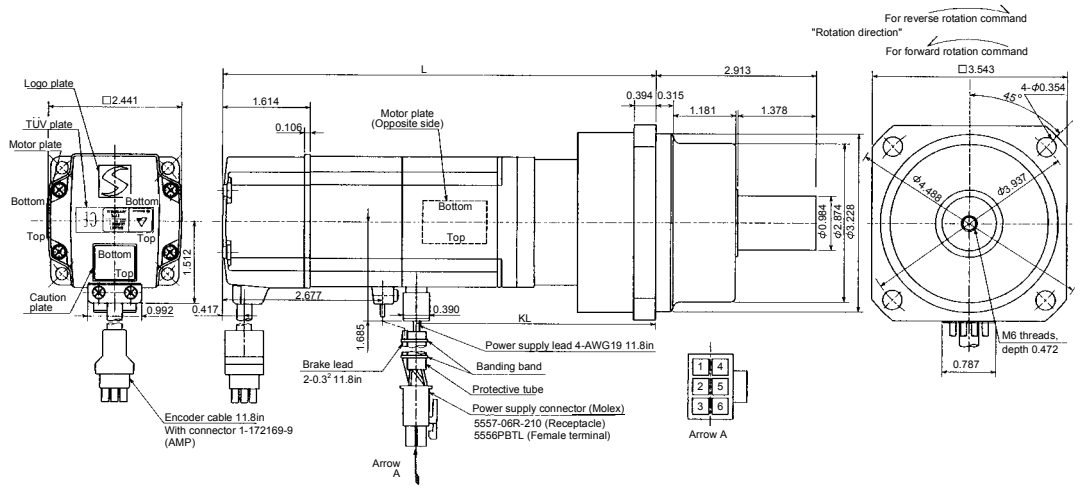
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11903*
(BC11931*)

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio (Actual Reduction Ratio)	Inertia Moment WK^2[oz ▪ in^2]	Mass [lb]
		L	KL					
HC-MFS43BG1	400	8.27	4.95	184	K9005	1/5(19/96)	1.88	9.7
HC-MFS43BG1	400	9.06	5.73	184	K9012	1/12(25/288)	2.12	11.0
HC-KFS43BG1	400	8.27	4.95	184	K9005	1/5(19/96)	3.609	9.7
HC-KFS43BG1	400	9.06	5.73	184	K9012	1/12(25/288)	3.882	11.0

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11904*
(BC11932*)

7. OUTLINE DIMENSION DRAWINGS

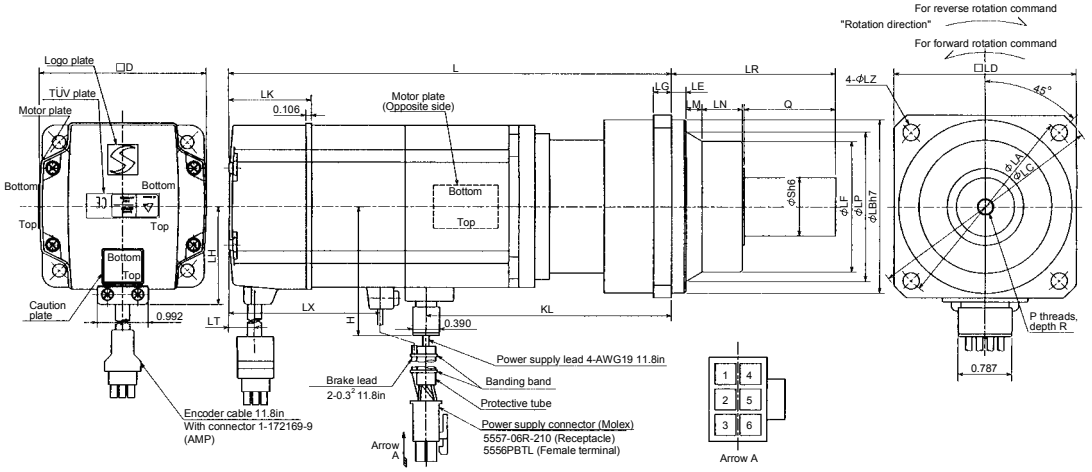
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-MFS43BG1	400	184	K10020	1/20	253/5000	3.83	60min. max.	13.4
HC-MFS73BG1	750	340	K10005	1/5	1/5	6.26	60min. max.	15.9
HC-MFS73BG1	750	340	K10012	1/12	525/6048	9.90	60min. max.	18.3
HC-MFS73BG1	750	340	K12020	1/20	625/12544	10.25	60min. max.	25.8

Model	Output [W]	Variable Dimensions [in]																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-MFS43BG1	400	2.44	1.51	1.64	0.14	2.68	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.19	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-MFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.55	3.54	5.92	0.35	1.97	1.26	M8	0.63
HC-MFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	10.41	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-MFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	10.93	4.17	7.35	0.55	2.36	1.57	M10	0.79

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio		Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
				Normal Reduction ratio	Actual Reduction Ratio			
HC-KFS43BG1	400	184	K10020	1/20	253/5000	5.577	60min. max.	13.4
HC-KFS73BG1	750	340	K10005	1/5	1/5	11.24	60min. max.	15.9
HC-KFS73BG1	750	340	K10012	1/12	525/6048	14.88	60min. max.	18.3
HC-KFS73BG1	750	340	K12020	1/20	625/12544	15.23	60min. max.	25.8

Model	Output [W]	Variable Dimensions [in]																							
		D	LH	LK	LT	LX	H	LA	LB	LC	LD	LE	LF	LG	LM	LN	LP	L	LR	KL	LZ	Q	S	P	R
HC-KFS43BG1	400	2.44	1.51	1.64	0.14	2.68	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.19	3.54	5.87	0.35	1.97	1.26	M8	0.63
HC-KFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	9.55	3.54	5.92	0.35	1.97	1.26	M8	0.63
HC-KFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	4.53	3.74	5.20	3.94	0.39	2.87	0.39	0.512	0.63	3.39	10.41	3.54	6.84	0.35	1.97	1.26	M8	0.63
HC-KFS73BG1	750	3.23	1.92	1.54	0.43	2.84	1.69	5.51	4.53	6.38	4.72	0.47	3.54	0.59	0.512	0.787	4.09	10.93	4.17	7.35	0.55	2.36	1.57	M10	0.79

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11905*
(********)

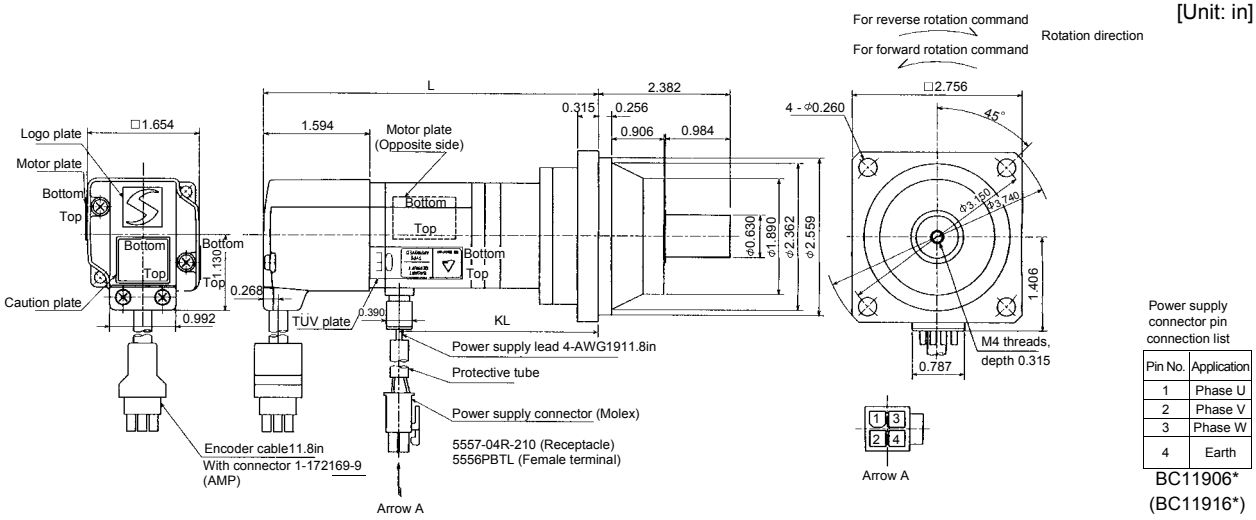
(4) With reduction gear for precision application

The outer frame of the reduction gear is a material surface such as casting. Its actual dimensions may be 0.039 to 0.118 in larger than the drawing dimensions. Design the machine side with allowances.

(a) Without electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
		L	KL					
HC-MFS053G2	50	5.12	3.07	BK1-05B-A5MEKA	1/5	0.36	3 min. max.	3.1
HC-MFS053G2	50	5.75	3.70	BK1-09B-A5MEKA	1/9	0.33	3 min. max.	3.7
HC-MFS053G2	50	5.75	3.70	BK1-20B-A5MEKA	1/20	0.38	3 min. max.	4.0
HC-MFS053G2	50	5.75	3.70	BK1-29B-A5MEKA	1/29	0.31	3 min. max.	4.0
HC-KFS053G2	50	5.12	3.07	BK1-05B-A5MEKA	1/5	0.55	3 min. max.	3.1
HC-KFS053G2	50	5.75	3.70	BK1-09B-A5MEKA	1/9	0.52	3 min. max.	3.7
HC-KFS053G2	50	5.75	3.70	BK1-20B-A5MEKA	1/20	0.57	3 min. max.	4.0
HC-KFS053G2	50	5.75	3.70	BK1-29B-A5MEKA	1/29	0.50	3 min. max.	4.0

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11906*
(BC11916*)

7. OUTLINE DIMENSION DRAWINGS

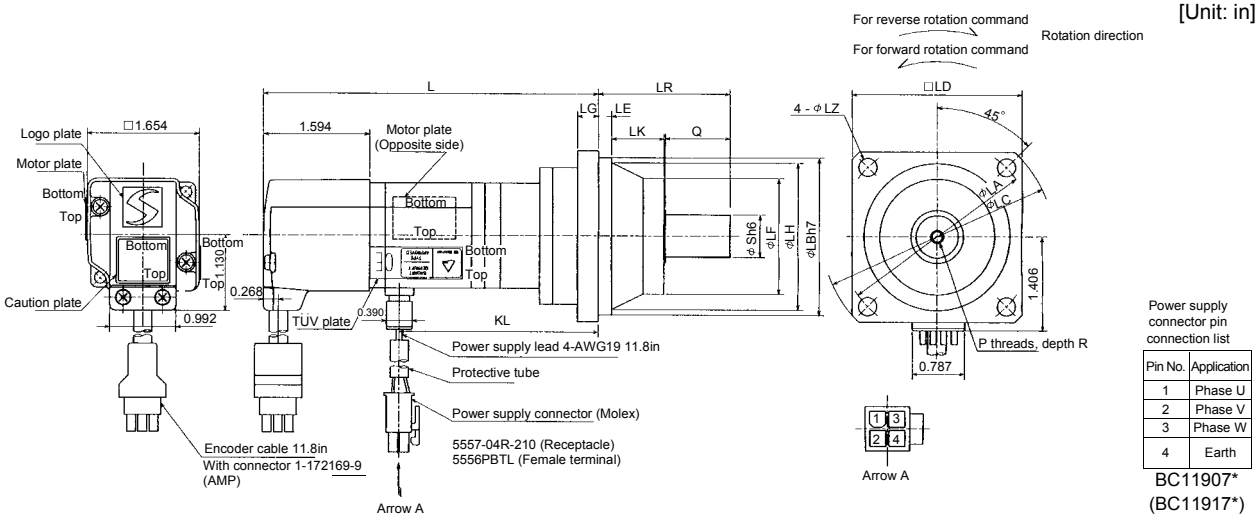
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HC-MFS13G2	100	BK1-05B-01MEKA	1/5	0.43	3 min. max.	3.3
HC-MFS13G2	100	BK1-09B-01MEKA	1/9	0.39	3 min. max.	4.0
HC-MFS13G2	100	BK2-20B-01MEKA	1/20	0.66	3 min. max.	6.6
HC-MFS13G2	100	BK2-29B-01MEKA	1/29	0.52	3 min. max.	6.6

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	5.71	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-MFS13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.34	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-MFS13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-MFS13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Backlash	Mass [lb]
HC-KFS13G2	100	BK1-05B-01MEKA	1/5	0.72	3 min. max.	3.3
HC-KFS13G2	100	BK1-09B-01MEKA	1/9	0.69	3 min. max.	4.0
HC-KFS13G2	100	BK2-20B-01MEKA	1/20	0.96	3 min. max.	6.6
HC-KFS13G2	100	BK2-29B-01MEKA	1/29	0.82	3 min. max.	6.6

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	5.71	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-KFS13G2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.34	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-KFS13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-KFS13G2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.57	2.95	4.53	0.26	1.38	0.79	M5	0.39

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11907*
(BC11917*)

7. OUTLINE DIMENSION DRAWINGS

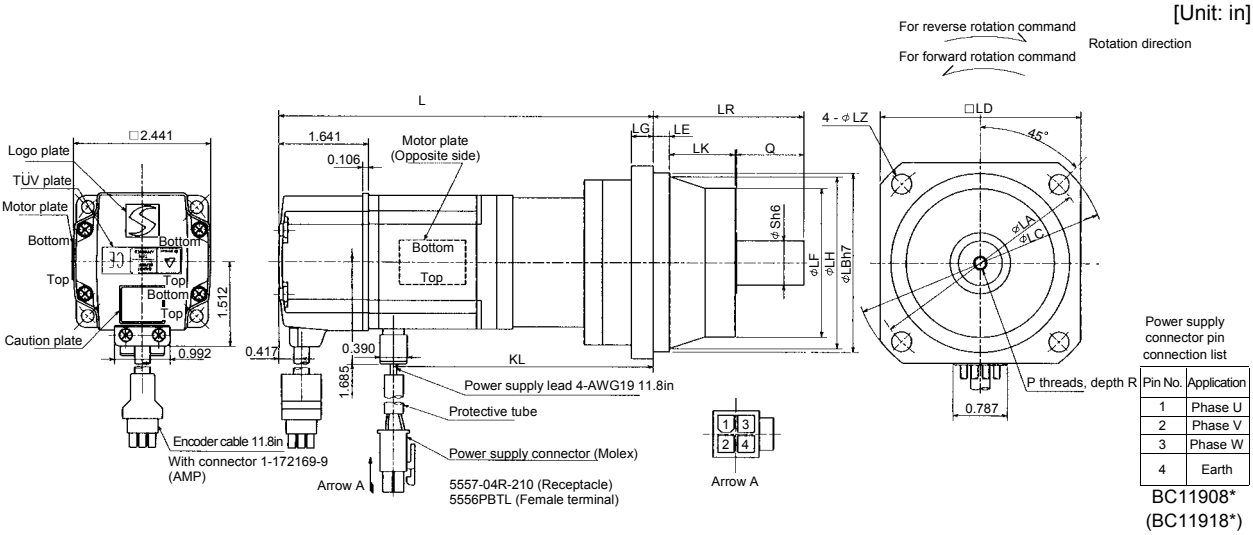
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-MFS23G2	200	BK1-05B-02MEKA	1/5	1.04	4.6
HC-MFS23G2	200	BK2-09B-02MEKA	1/9	1.14	7.7
HC-MFS23G2	200	BK3-20B-02MEKA	1/20	1.95	11.0
HC-MFS23G2	200	BK3-29B-02MEKA	1/29	1.51	11.0

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS23G2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.18	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-MFS23G2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.89	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-MFS23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-MFS23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-KFS23G2	200	BK1-05B-02MEKA	1/5	1.968	4.6
HC-KFS23G2	200	BK2-09B-02MEKA	1/9	2.078	7.7
HC-KFS23G2	200	BK3-20B-02MEKA	1/20	2.898	11.0
HC-KFS23G2	200	BK3-29B-02MEKA	1/29	2.460	11.0

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS23G2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.18	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-KFS23G2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	6.89	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-KFS23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-KFS23G2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	7.09	3.35	5.10	0.35	1.57	0.98	M6	0.47

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11908*
(BC11918*)

7. OUTLINE DIMENSION DRAWINGS

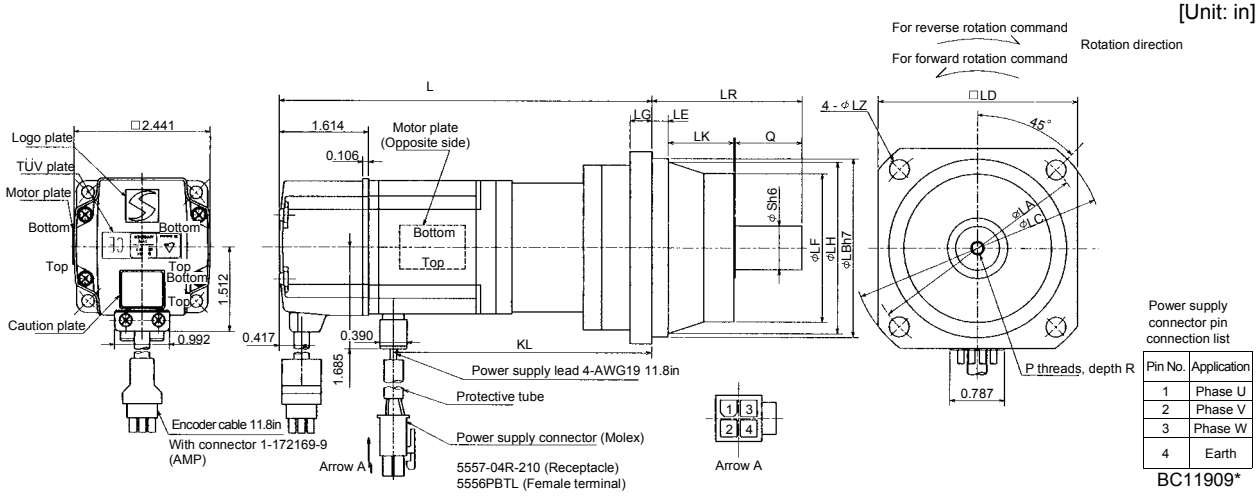
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-MFS43G2	400	BK2-05B-04MEKA	1/5	1.61	8.2
HC-MFS43G2	400	BK3-09B-04MEKA	1/9	1.77	11.7
HC-MFS43G2	400	BK4-20B-04MEKA	1/20	2.33	16.5
HC-MFS43G2	400	BK4-29B-04MEKA	1/29	1.85	16.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS43G2	400	3.94	3.15	4.53	3.35	0.24	2.56	0.39	2.91	1.3	7.24	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-MFS43G2	400	4.53	3.74	5.31	3.94	0.31	2.95	0.39	3.35	1.38	8.07	3.35	6.01	0.35	1.58	0.98	M6	0.47
HC-MFS43G2	400	5.32	3.94	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-MFS43G2	400	5.32	4.33	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	6.24	0.43	1.26	1.26	M8	0.63

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-KFS43G2	400	BK2-05B-04MEKA	1/5	3.335	8.2
HC-KFS43G2	400	BK3-09B-04MEKA	1/9	3.499	11.7
HC-KFS43G2	400	BK4-20B-04MEKA	1/20	4.046	16.5
HC-KFS43G2	400	BK4-29B-04MEKA	1/29	3.609	16.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS43G2	400	3.94	3.15	4.53	3.35	0.24	2.56	0.39	2.91	1.3	7.24	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-KFS43G2	400	4.53	3.74	5.31	3.94	0.31	2.95	0.39	3.35	1.38	8.07	3.35	6.01	0.35	1.58	0.98	M6	0.47
HC-KFS43G2	400	5.32	4.33	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	0.43	0.43	1.97	1.26	M8	0.63
HC-KFS43G2	400	5.32	4.33	6.10	4.53	0.31	3.54	0.47	3.94	1.58	8.31	3.94	0.43	0.43	1.26	1.26	M8	0.63

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11909*
(BC11919*)

7. OUTLINE DIMENSION DRAWINGS

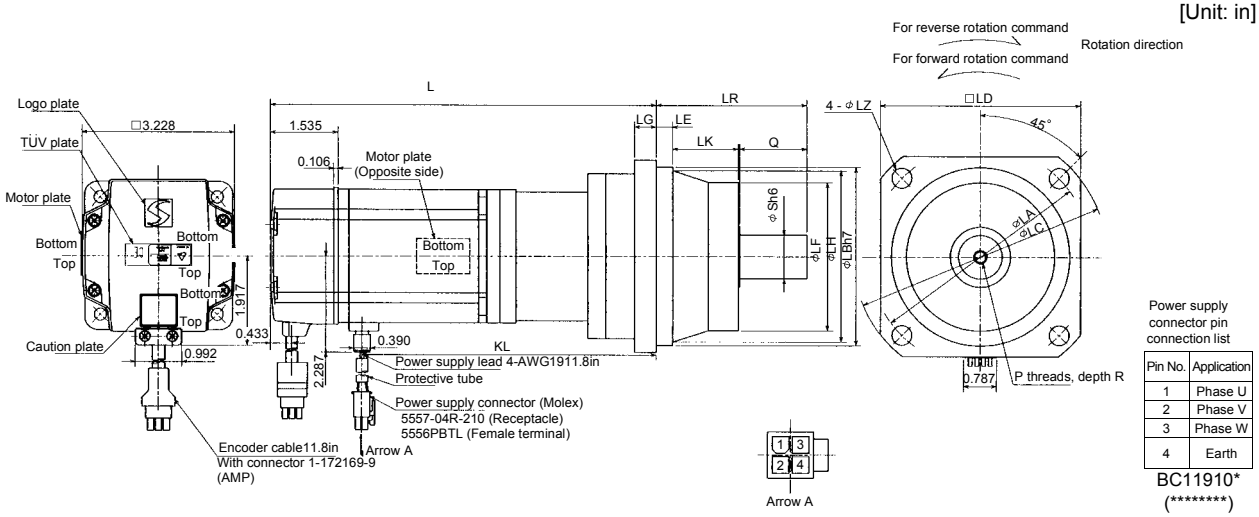
Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS73G2	750	BK3-05B-08MEKA	1/5	5.32	13.89
HC-MFS73G2	750	BK4-09B-08MEKA	1/9	5.36	18.96
HC-MFS73G2	750	BK5-20B-08MEKA	1/20	5.55	26.46
HC-MFS73G2	750	BK5-29B-08MEKA	1/29	4.97	26.46

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS73G2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-MFS73G2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.45	3.94	7.27	0.43	1.97	1.26	M8	0.63
HC-MFS73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-MFS73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79

Model	Output [W]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KFS73G2	750	BK3-05B-08MEKA	1/5	10.30	13.89
HC-KFS73G2	750	BK4-09B-08MEKA	1/9	10.33	18.96
HC-KFS73G2	750	BK5-20B-08MEKA	1/20	10.53	26.46
HC-KFS73G2	750	BK5-29B-08MEKA	1/29	9.95	26.46

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS73G2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-KFS73G2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.45	3.94	7.27	0.43	1.97	1.26	M8	0.63
HC-KFS73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-KFS73G2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	9.76	4.53	7.59	0.55	2.36	1.57	M10	0.79

[Unit: in]



Power supply connector pin connection list

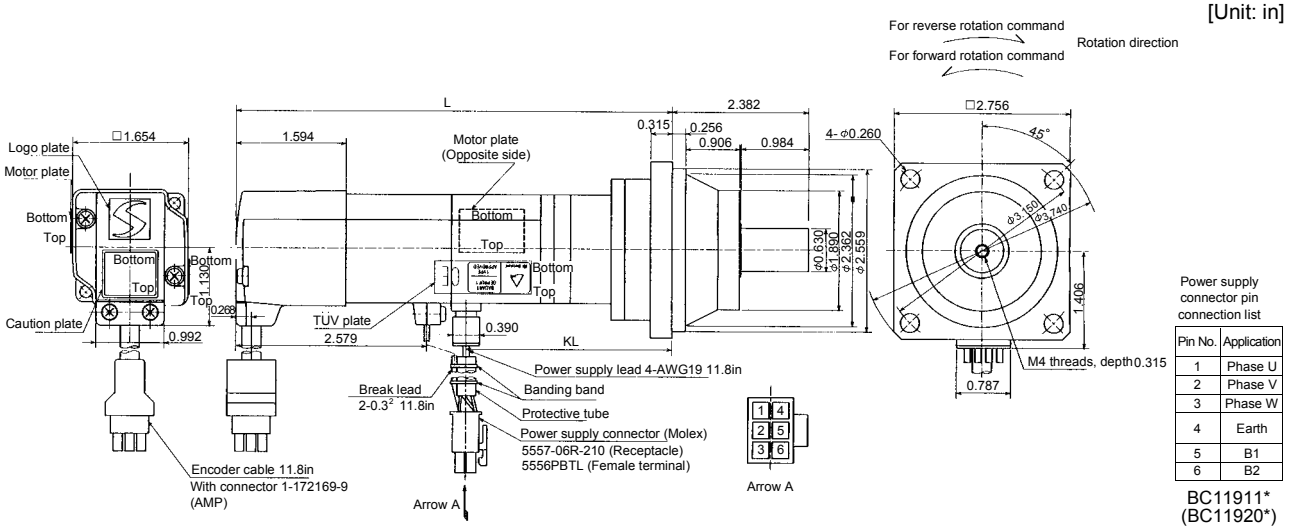
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11910*
(********)

(b) With electromagnetic brake

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz ▪ in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz ▪ in^2]	Backlash	Mass [lb]
		L	KL						
HC-MFS053BG2	50	6.22	3.07	45	BK1-05B-A5MEKA	1/5	0.38	3 min. max.	4.0
HC-MFS053BG2	50	6.85	3.70	45	BK1-09B-A5MEKA	1/9	0.34	3 min. max.	4.6
HC-MFS053BG2	50	6.85	3.70	45	BK1-20B-A5MEKA	1/20	0.39	3 min. max.	4.9
HC-MFS053BG2	50	6.85	3.70	45	BK1-29B-A5MEKA	1/29	0.33	3 min. max.	4.9
HC-KFS053BG2	50	6.22	3.07	45	BK1-05B-A5MEKA	1/5	0.57	3 min. max.	4.0
HC-KFS053BG2	50	6.85	3.70	45	BK1-09B-A5MEKA	1/9	0.54	3 min. max.	4.6
HC-KFS053BG2	50	6.85	3.70	45	BK1-20B-A5MEKA	1/20	0.59	3 min. max.	4.9
HC-KFS053BG2	50	6.85	3.70	45	BK1-29B-A5MEKA	1/29	0.52	3 min. max.	4.9

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11911*
(BC11920*)

7. OUTLINE DIMENSION DRAWINGS

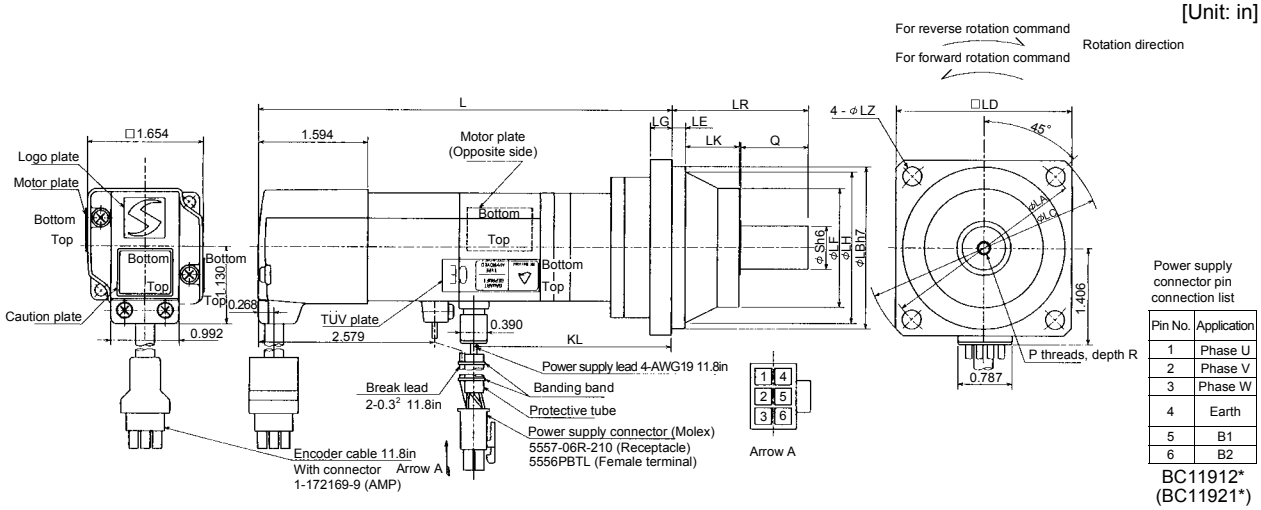
Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HC-MFS13BG2	100	45	BK1-05B-01MEKA	1/5	0.44	3 min. max.	4.2
HC-MFS13BG2	100	45	BK1-09B-01MEKA	1/9	0.40	3 min. max.	4.9
HC-MFS13BG2	100	45	BK2-20B-01MEKA	1/20	0.68	3 min. max.	7.5
HC-MFS13BG2	100	45	BK2-29B-01MEKA	1/29	0.53	3 min. max.	7.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.81	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-MFS13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-MFS13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-MFS13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39

Model	Output [W]	Brake static friction torque [oz • in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz • in^2]	Backlash	Mass [lb]
HC-KFS13BG2	100	45	BK1-05B-01MEKA	1/5	0.74	3 min. max.	4.2
HC-KFS13BG2	100	45	BK1-09B-01MEKA	1/9	0.71	3 min. max.	4.9
HC-KFS13BG2	100	45	BK2-20B-01MEKA	1/20	0.98	3 min. max.	7.5
HC-KFS13BG2	100	45	BK2-29B-01MEKA	1/29	0.84	3 min. max.	7.5

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	6.81	2.17	3.66	0.26	0.98	0.63	M4	0.31
HC-KFS13BG2	100	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.29	0.26	0.98	0.63	M4	0.31
HC-KFS13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39
HC-KFS13BG2	100	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	7.68	2.95	4.53	0.26	1.38	0.79	M5	0.39

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11912*
(BC11921*)

7. OUTLINE DIMENSION DRAWINGS

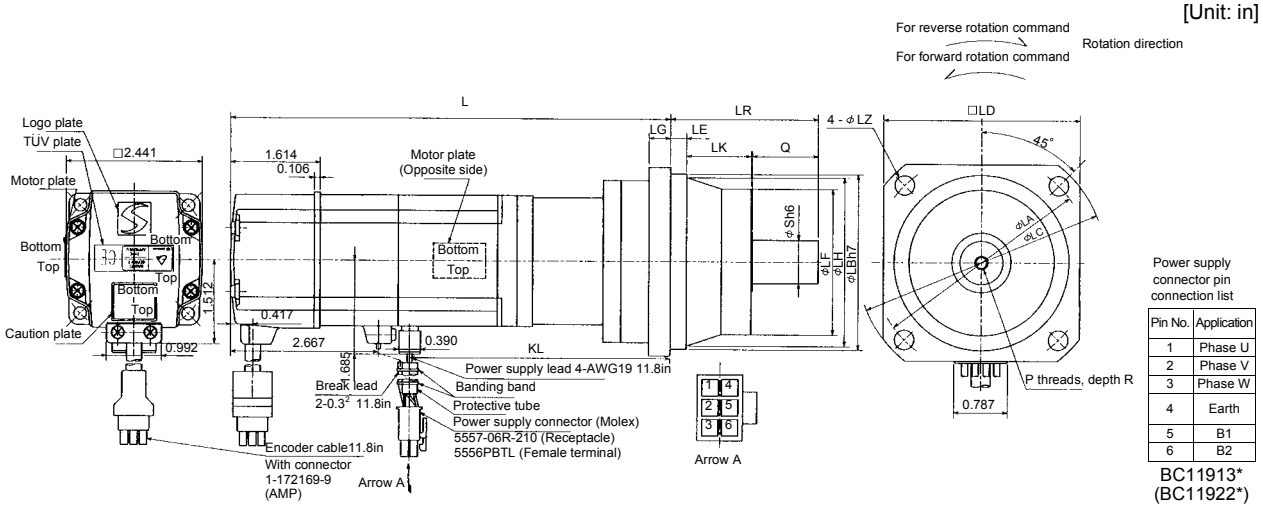
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS23BG2	200	184	BK1-05B-02MEKA	1/5	1.31	6.0
HC-MFS23BG2	200	184	BK2-09B-02MEKA	1/9	1.40	9.0
HC-MFS23BG2	200	184	BK3-20B-02MEKA	1/20	2.21	12.3
HC-MFS23BG2	200	184	BK3-29B-02MEKA	1/29	1.77	12.3

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS23BG2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-MFS23BG2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.15	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-MFS23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-MFS23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KFS23BG2	200	184	BK1-05B-02MEKA	1/5	2.242	6.0
HC-KFS23BG2	200	184	BK2-09B-02MEKA	1/9	2.351	9.0
HC-KFS23BG2	200	184	BK3-20B-02MEKA	1/20	3.171	12.3
HC-KFS23BG2	200	184	BK3-29B-02MEKA	1/29	2.734	12.3

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS23BG2	200	3.15	2.56	3.74	2.76	0.24	1.89	0.31	2.362	0.906	7.44	2.17	4.20	0.26	0.98	0.63	M4	0.31
HC-KFS23BG2	200	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.15	2.95	4.91	0.26	1.38	0.79	M5	0.39
HC-KFS23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47
HC-KFS23BG2	200	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	8.35	3.35	5.10	0.35	1.57	0.98	M6	0.47

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11913*
(BC11922*)

7. OUTLINE DIMENSION DRAWINGS

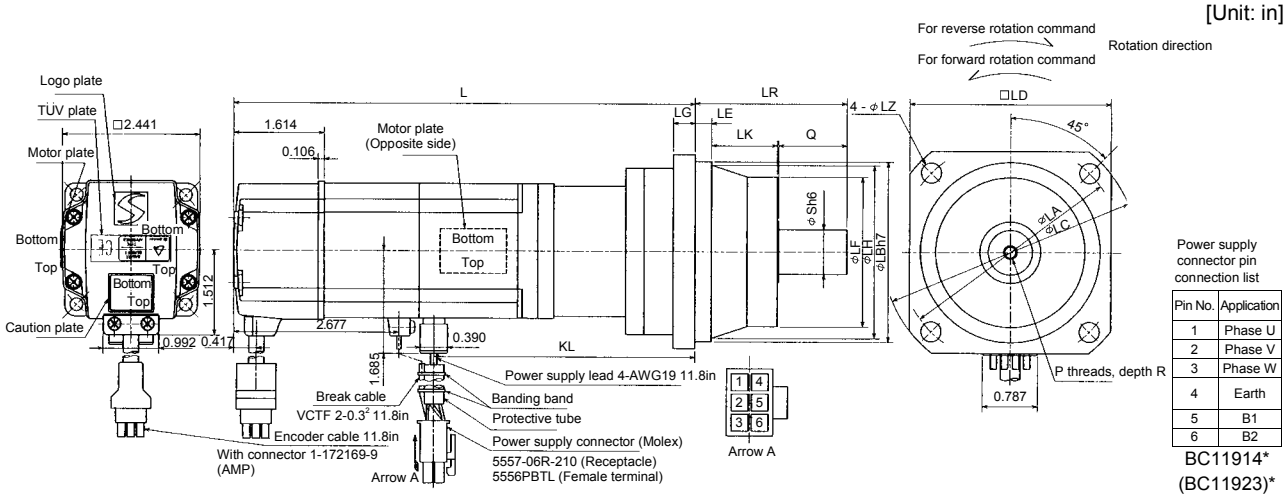
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS43BG2	400	184	BK2-05B-04MEKA	1/5	1.88	9.5
HC-MFS43BG2	400	184	BK3-09B-04MEKA	1/9	2.03	13.0
HC-MFS43BG2	400	184	BK4-20B-04MEKA	1/20	2.59	17.9
HC-MFS43BG2	400	184	BK4-29B-04MEKA	1/29	2.11	17.9

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS43BG2	400	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.50	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-MFS43BG2	400	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.33	3.35	6.01	0.35	1.57	0.98	M6	0.47
HC-MFS43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-MFS43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KFS43BG2	400	184	BK2-05B-04MEKA	1/5	3.609	9.5
HC-KFS43BG2	400	184	BK3-09B-04MEKA	1/9	3.773	13.0
HC-KFS43BG2	400	184	BK4-20B-04MEKA	1/20	4.319	17.9
HC-KFS43BG2	400	184	BK4-29B-04MEKA	1/29	3.882	17.9

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS43BG2	400	3.94	3.15	4.53	3.35	0.24	2.559	0.39	2.913	1.299	8.50	2.95	5.18	0.26	1.38	0.79	M5	0.39
HC-KFS43BG2	400	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.33	3.35	6.01	0.35	1.57	0.98	M6	0.47
HC-KFS43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63
HC-KFS43BG2	400	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	9.57	3.94	6.24	0.43	1.97	1.26	M8	0.63

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11914*
(BC11923)*

7. OUTLINE DIMENSION DRAWINGS

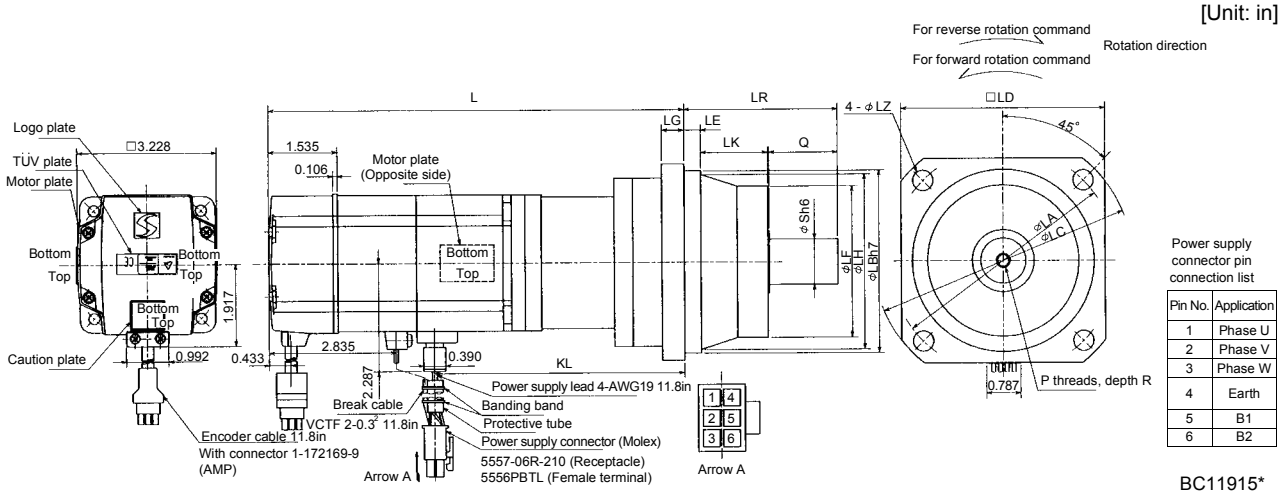
Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-MFS73BG2	750	340	BK3-05B-08MEKA	1/5	6.00	16.1
HC-MFS73BG2	750	340	BK4-09B-08MEKA	1/9	6.04	21.2
HC-MFS73BG2	750	340	BK5-20B-08MEKA	1/20	6.24	28.7
HC-MFS73BG2	750	340	BK5-29B-08MEKA	1/29	5.66	28.7

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-MFS73BG2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.74	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-MFS73BG2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	11.16	3.94	7.59	0.43	1.97	1.26	M8	0.63
HC-MFS73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-MFS73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79

Model	Output [W]	Brake static friction torque [oz・in]	Reduction Gear Model	Reduction Ratio	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-KFS73BG2	750	340	BK3-05B-08MEKA	1/5	10.98	16.1
HC-KFS73BG2	750	340	BK4-09B-08MEKA	1/9	11.02	21.2
HC-KFS73BG2	750	340	BK5-20B-08MEKA	1/20	11.21	28.7
HC-KFS73BG2	750	340	BK5-29B-08MEKA	1/29	10.63	28.7

Model	Output [W]	Variable Dimensions [in]																
		LA	LB	LC	LD	LE	LF	LG	LH	LK	L	LR	KL	LZ	Q	S	P	R
HC-KFS73BG2	750	4.53	3.74	5.31	3.94	0.31	2.953	0.39	3.346	1.378	9.74	3.35	6.17	0.35	1.57	0.98	M6	0.47
HC-KFS73BG2	750	5.31	4.33	6.10	4.53	0.31	3.543	0.47	3.937	1.575	10.85	3.94	7.27	0.43	1.97	1.26	M8	0.63
HC-KFS73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79
HC-KFS73BG2	750	5.91	4.92	6.89	5.12	0.39	4.134	0.59	4.528	1.693	11.16	4.53	7.59	0.55	2.36	1.57	M10	0.79

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

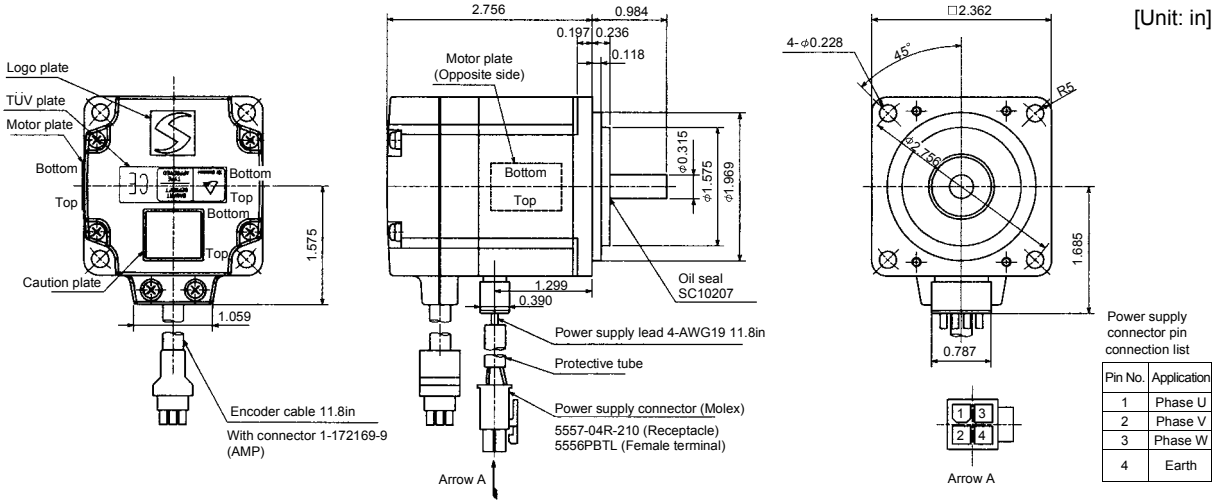
BC11915*
(********)

7.2.12 HC-UFS 3000r/min series

(1) Standard (without electromagnetic brake)

Model	Output [W]	Inertia Moment WK^2[oz·in^2]	Mass [lb]
HC-UFS13	100	0.36	1.76

[Unit: in]



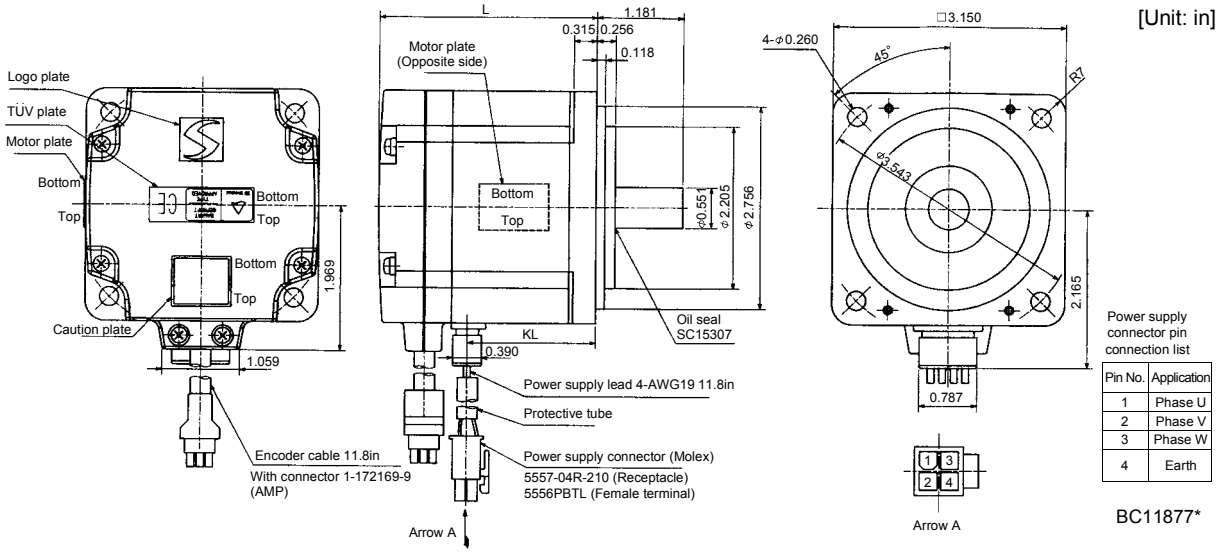
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11876*

Model	Output [W]	Variable Dimensions [in]		Inertia Moment WK^2[oz·in^2]	Mass [lb]
		L	KL		
HC-UFS23	200	3.03	1.72	1.32	3.31
HC-UFS43	400	3.62	2.31	2.00	3.75

[Unit: in]



Power supply connector pin connection list

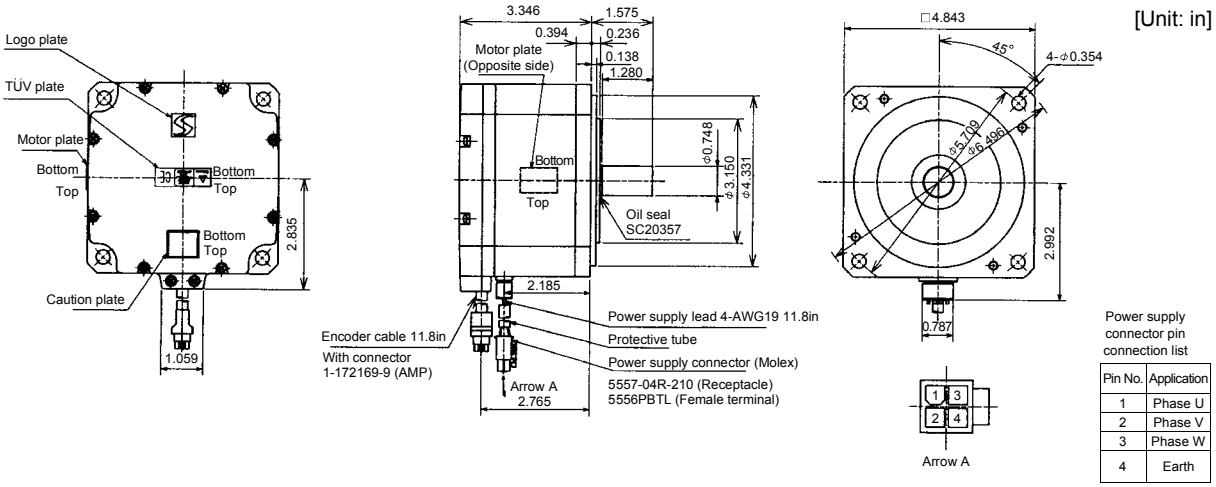
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11877*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UFS73	750	32.26	11.02

[Unit: in]



Power supply connector pin connection list

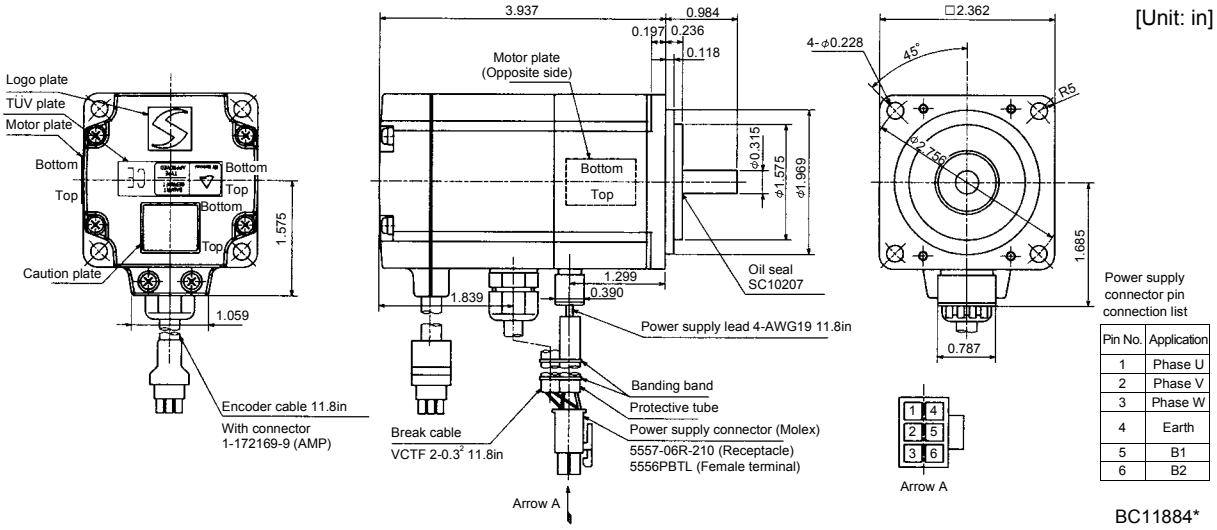
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth

BC11878*

(2) With electromagnetic brake

Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UFS13B	100	45.32	0.41	2.65

[Unit: in]



Power supply connector pin connection list

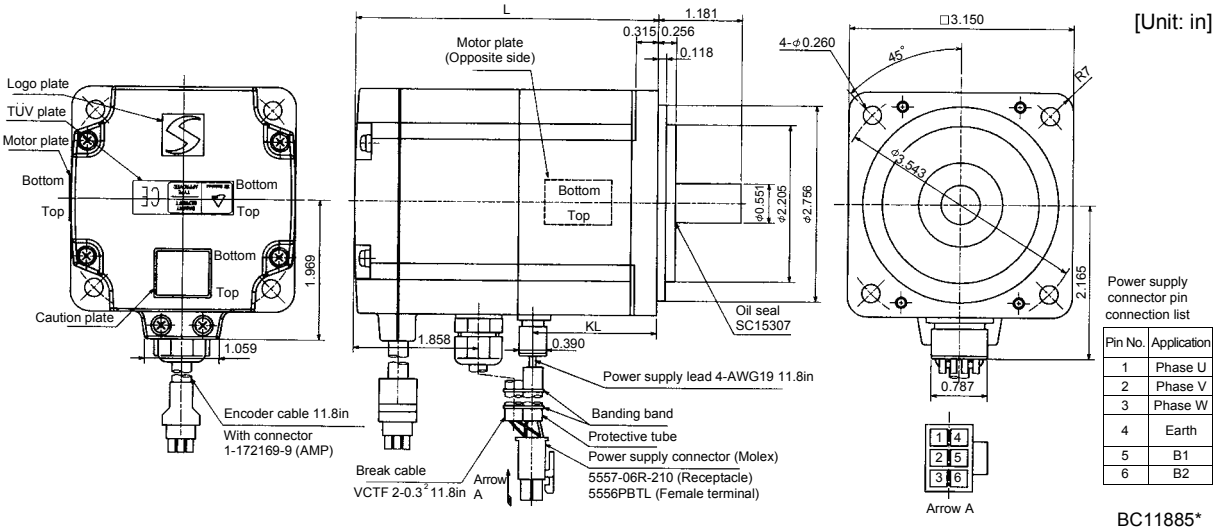
Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11884*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [W]	Variable Dimensions [in]		Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
		L	KL			
HC-UFS23B	200	4.37	1.72	184.1	1.77	4.85
HC-UFS43B	400	4.96	2.31	184.1	2.44	5.29

[Unit: in]



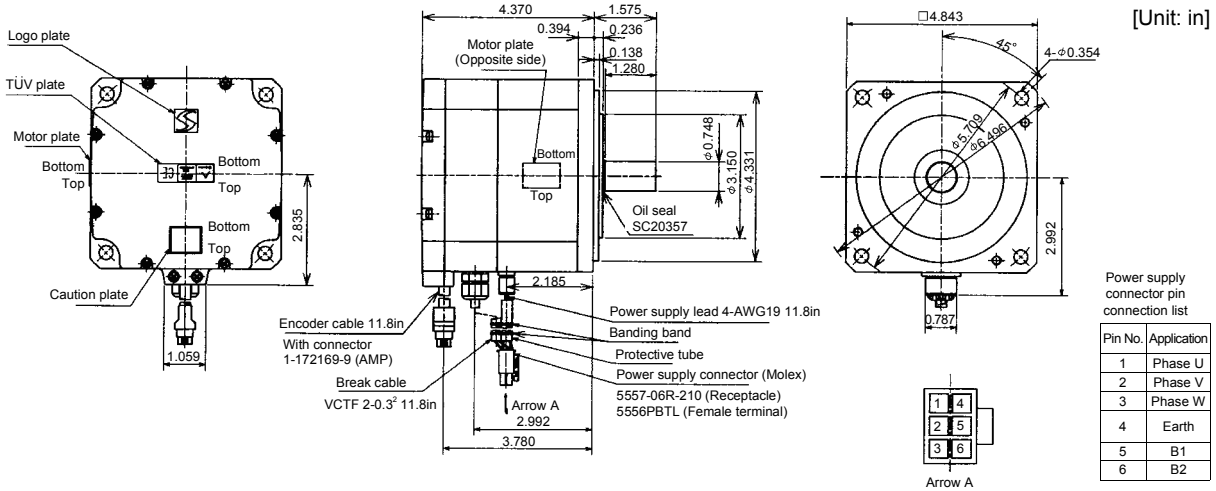
Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

BC11885*

Model	Output [W]	Brake static friction torque [oz • in]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-UFS73B	750	339.87	33.35	13.67

[Unit: in]



Power supply connector pin connection list

Pin No.	Application
1	Phase U
2	Phase V
3	Phase W
4	Earth
5	B1
6	B2

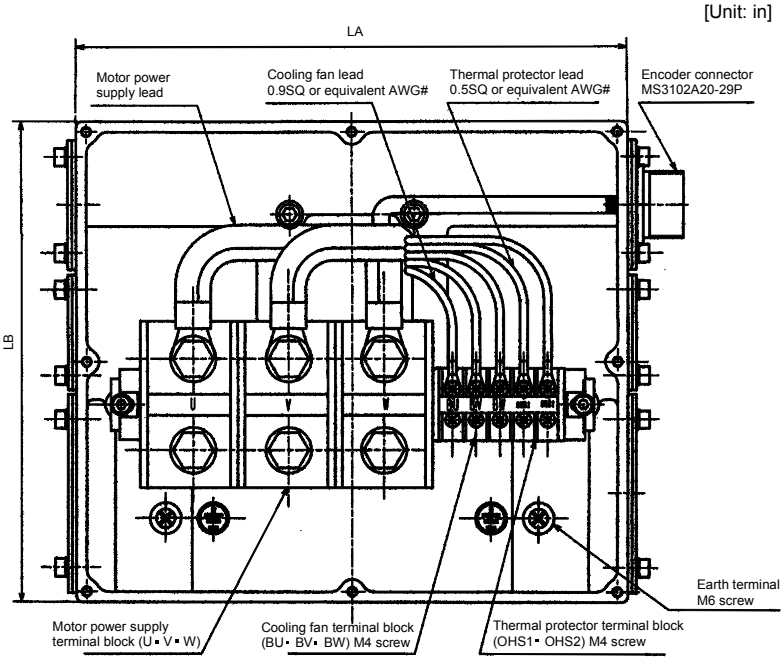
BC11886*

7.2.13 HA-LFS series

Terminal box detail diagram

Motor Model		HA-LFS15K1 HA-LFS20K1 HA-LFS22K1M HA-LFS15K14 HA-LFS20K14 HA-LFS22K1M4 HA-LFS30K1M4 HA-LFS30K24 HA-LFS37K24	HA-LFS25K1 to 37K1 HA-LFS30K1M・37K1M HA-LFS30K2・37K2 HA-LFS25K14 to 37K14 HA-LFS37K1M4 to 50K1M4 HA-LFS45K24・55K24
Motor power supply lead size		0.0124in² (AWG8) × 2 parallel	0.0341in²(AWG4) × 2 parallel
Motor power supply terminal block screw size		M8	M10
Terminal box dimensions (in)	LA	8.661	10.472
	LB	8.268	9.055

[Unit: in]



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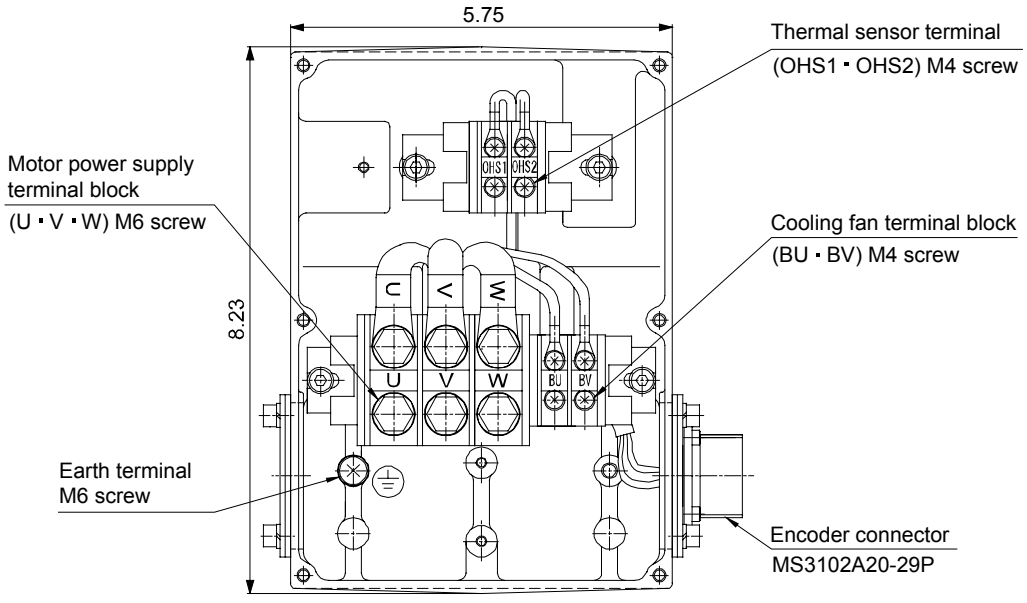
HA-LFS 601・701M・6014・701M4・11K2・11K24 terminal box detail diagram

(Note)[Unit: in]

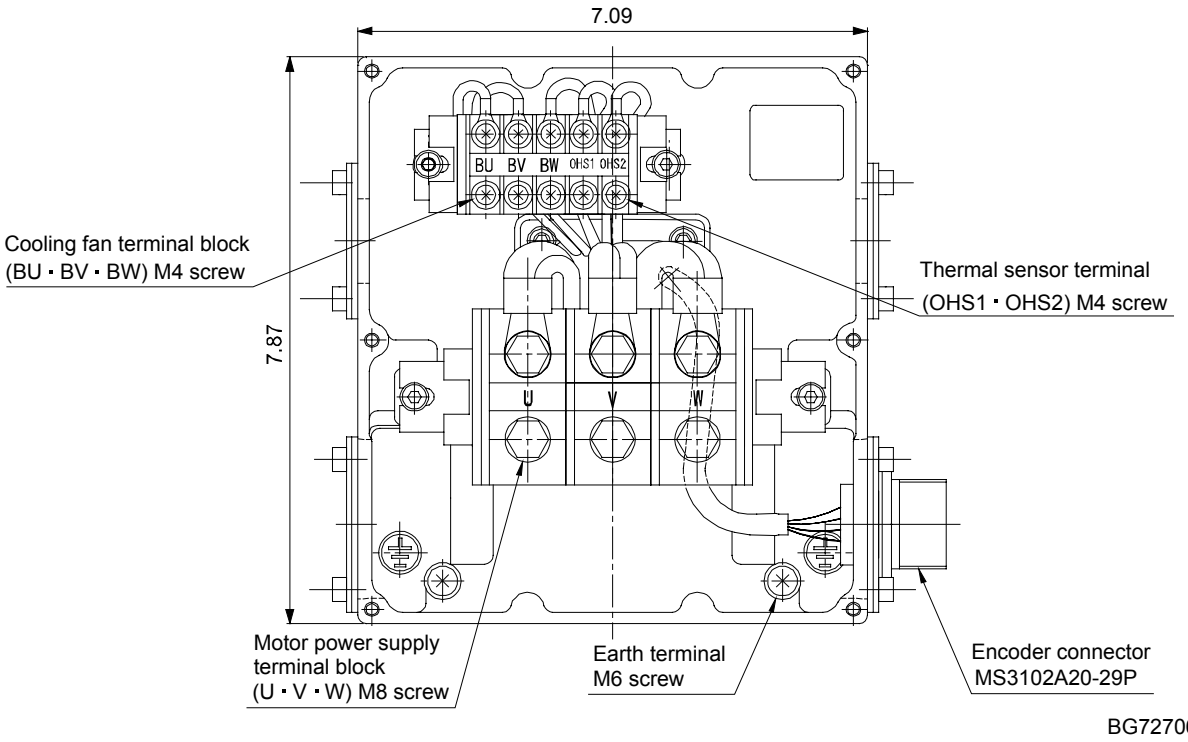


BG72707C

Note. The dimensions without tolerances are reference dimensions.

HA-LFS 801・12K1・11K1M・15K1M・15K2・22K2・8014・12K14・11K1M4・15K1M4・15K24・22K24
terminal box detail diagram

(Note)[Unit: in]

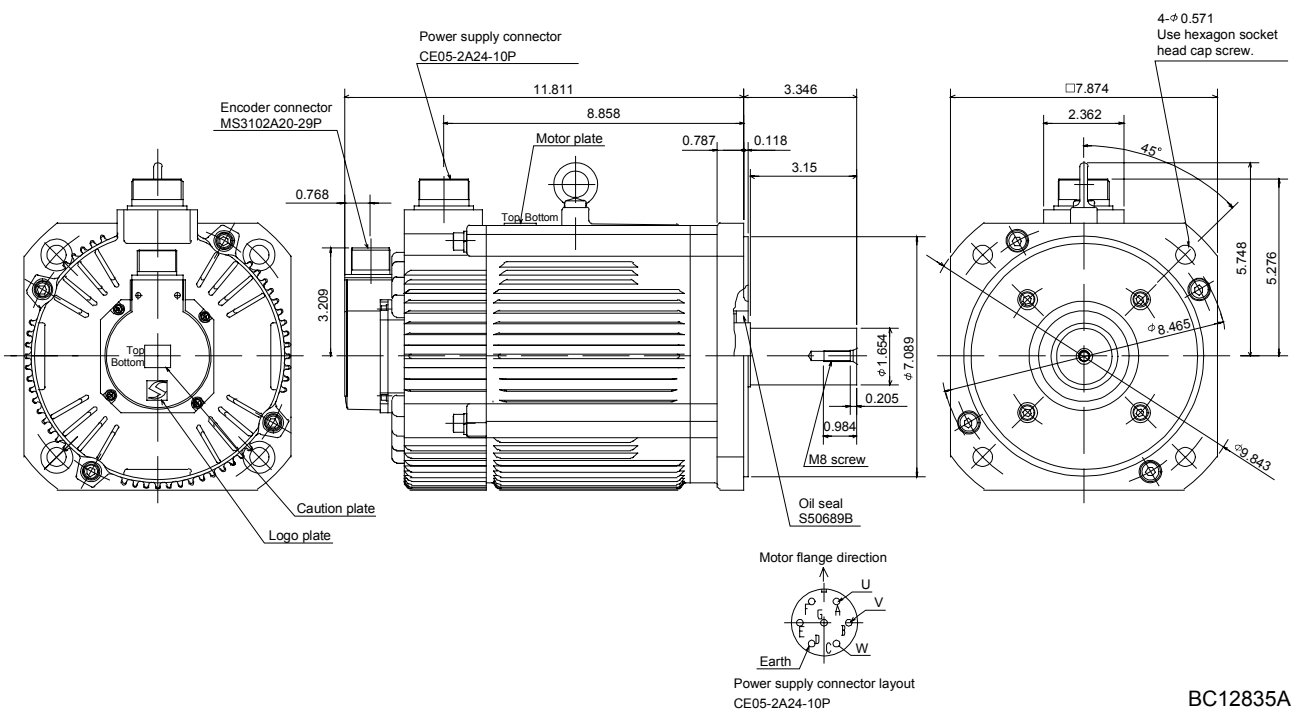


Note. The dimensions without tolerances are reference dimensions.

(1) Standard (without electromagnetic brake, without reduction gear)

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS502	5	404.59	61.73

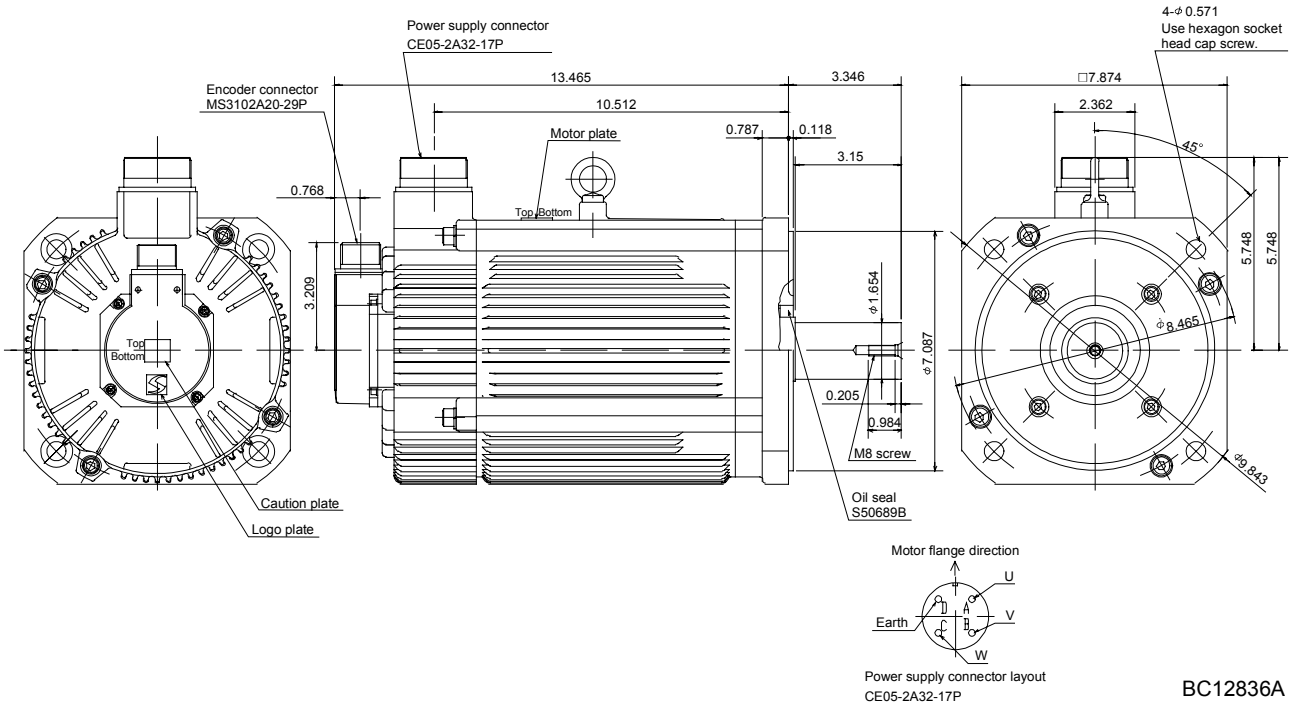
[Unit: in]



BC12835A

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS702	7	515.03	77.16

[Unit: in]

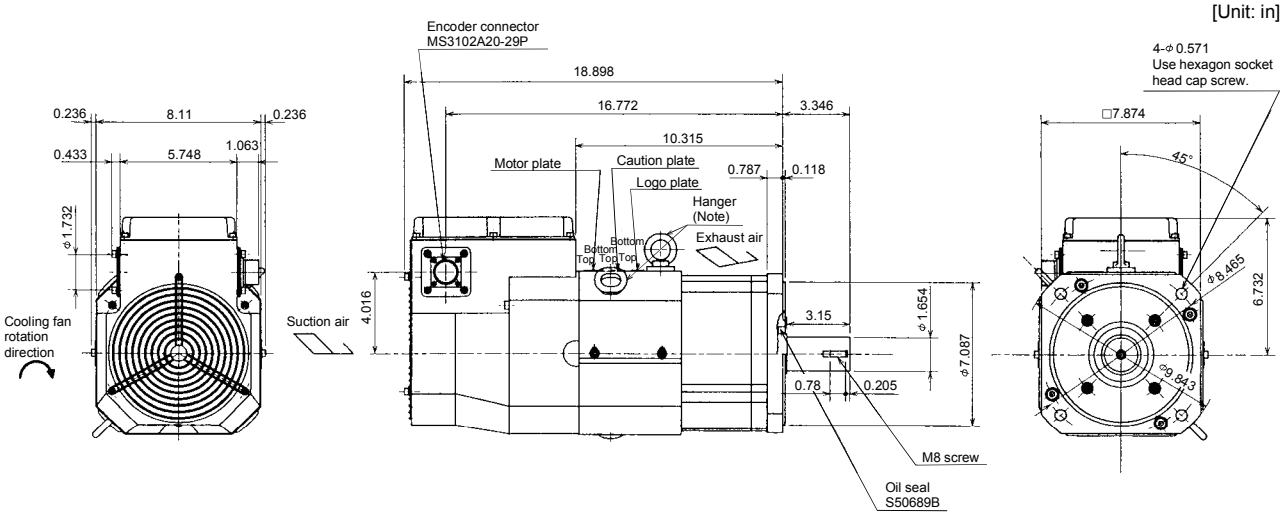


BC12836A

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS601 HA-LFS6014	6	574.08	121.25
HA-LFS701M HA-LFS701M4	7		
HA-LFS11K2 HA-LFS11K24	11		

[Unit: in]

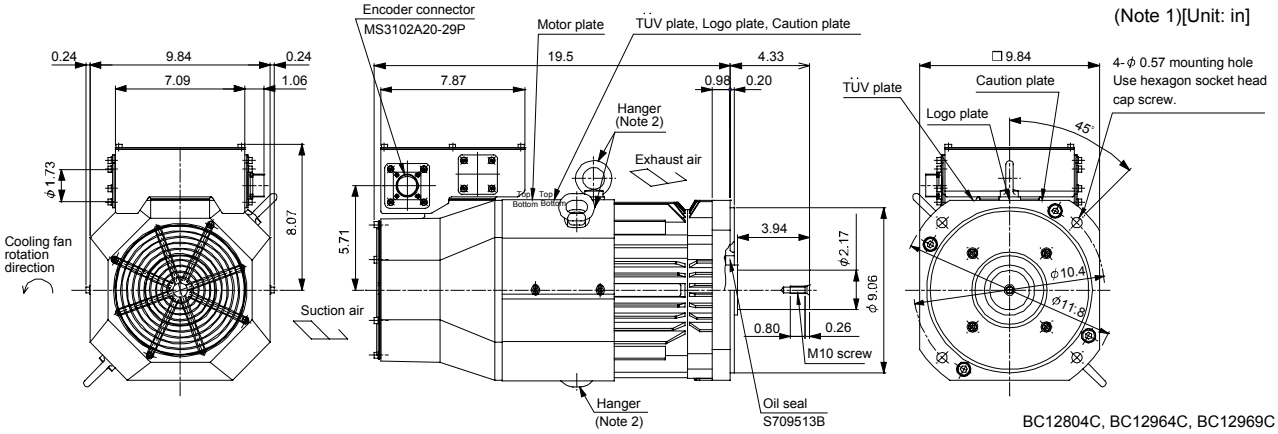


BC12837A, BC12582*, BC12967A

Note. When the motor is used without the hanger, plug the threaded hole with a bolt of M10 × 20 mm or less.

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS801 HA-LFS8014	8	1202.84	209.44
HA-LFS11K1M HA-LFS11K1M4	11		
HA-LFS15K2 HA-LFS15K24	15		

(Note 1)[Unit: in]



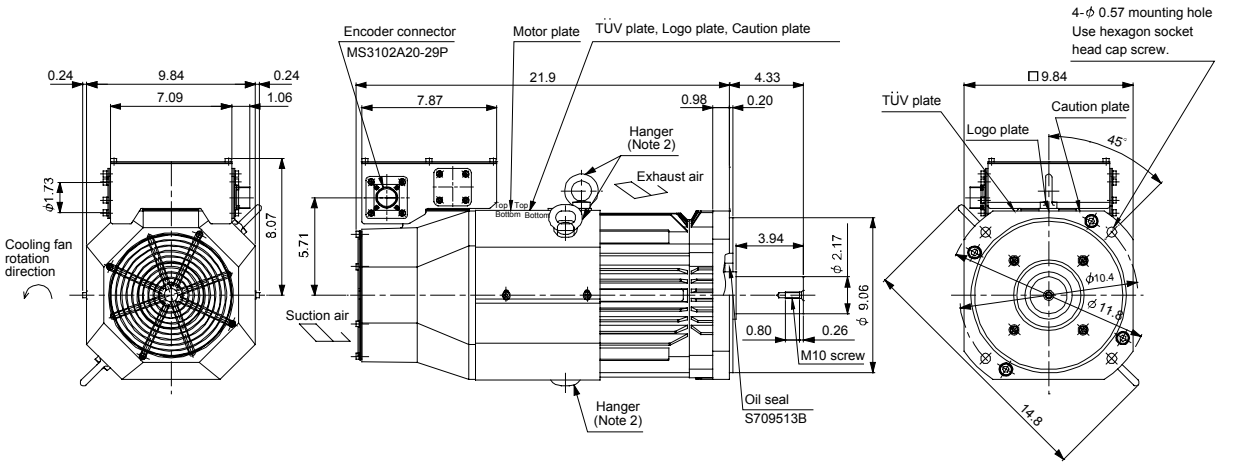
BC12804C, BC12964C, BC12969C
BC25028D, BC25670B, BC29888B

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS12K1 HA-LFS12K14	12	1612.9	253.53
HA-LFS15K1M HA-LFS15K1M4	15		
HA-LFS22K2 HA-LFS22K24	22		

(Note 1)[Unit: in]

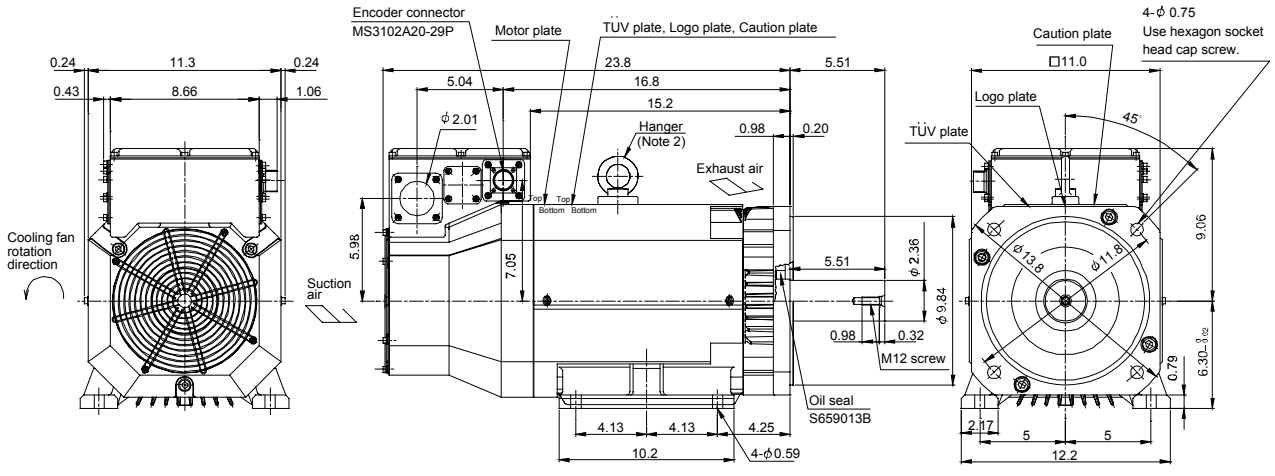


BC12970C, BC13039C, BC13158B
BC25300D, BC25349B, BC33032*

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12 × 20 mm or less.

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS15K1 HA-LFS15K14	15	3007.1	352.74
HA-LFS22K1M HA-LFS22K1M4	22		
HA-LFS30K24	30		

(Note 1)[Unit: in]



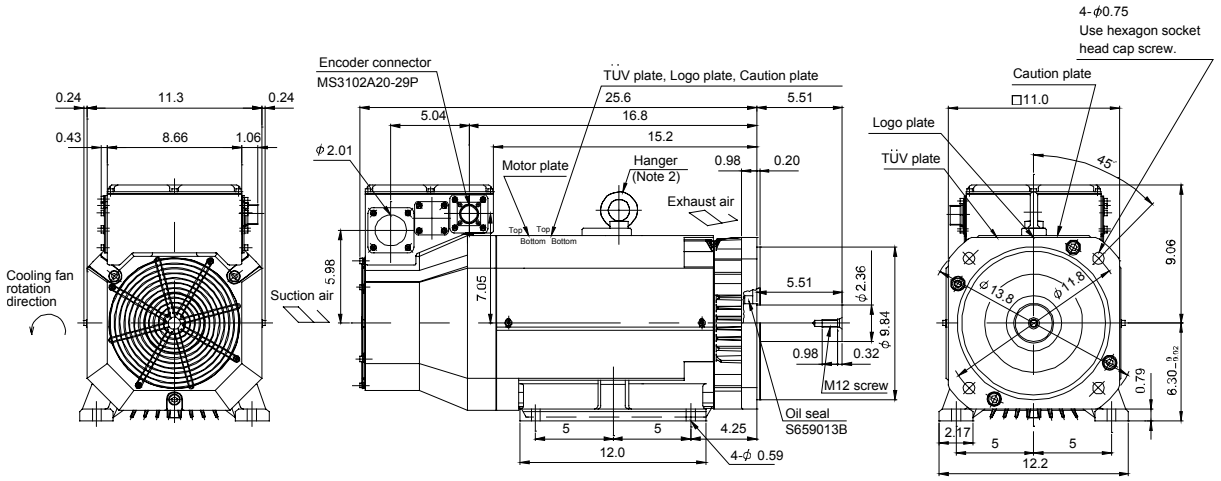
BC12966A, BC13040A
(BC13233B, BC13235*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M12 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS20K1 HA-LFS20K14	20	3553.84	396.83
HA-LFS30K1M4	30		
HA-LFS37K24	37		

(Note 1)[Unit: in]

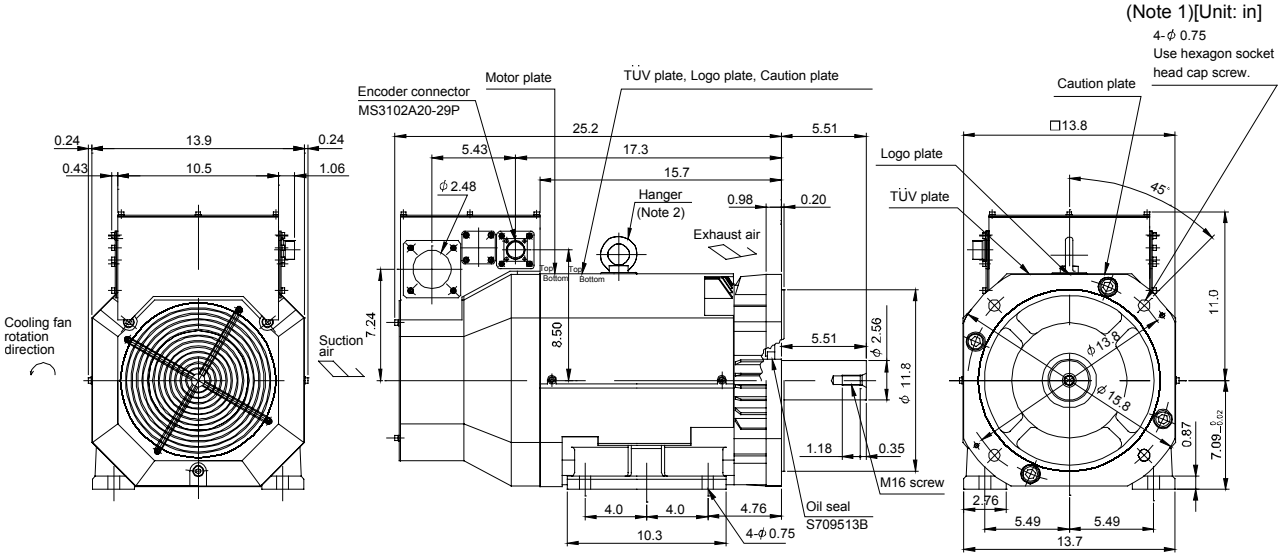


BC12972A
(BC13389B, BC13994*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS25K1 HA-LFS25K14	25	5904.84	507.06
HA-LFS37K1M HA-LFS37K1M4	37		
HA-LFS45K24	45		

(Note 1)[Unit: in]



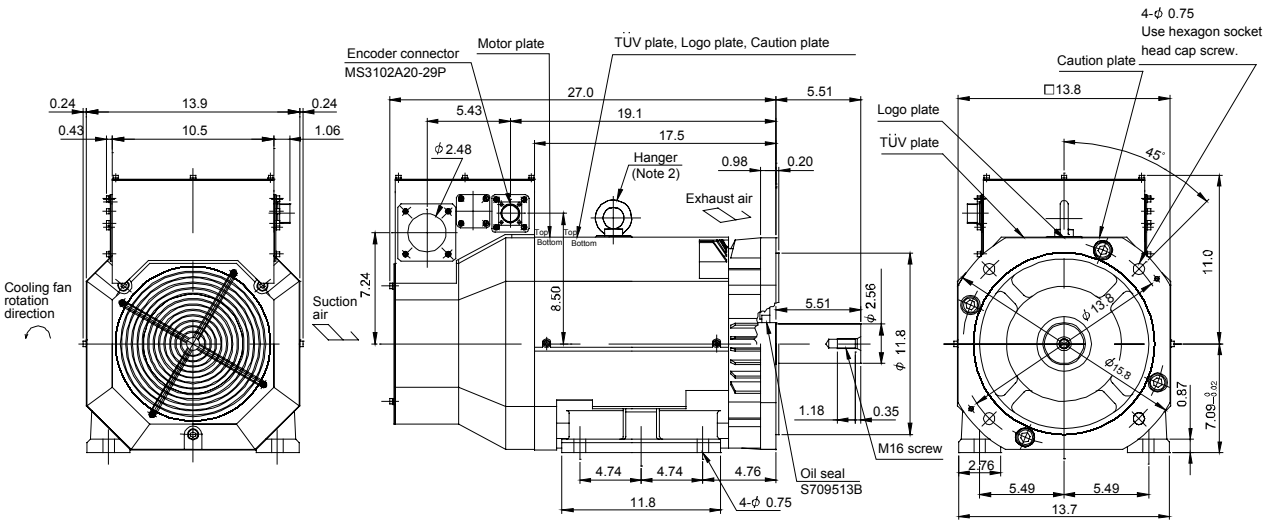
BC12508*, BC12973A
(BC13391B, BC13390*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS30K1 HA-LFS330K14	30	7162.35	551.16
HA-LFS45K1M4	45		
HA-LFS55K24	55		

(Note 1)[Unit: in]

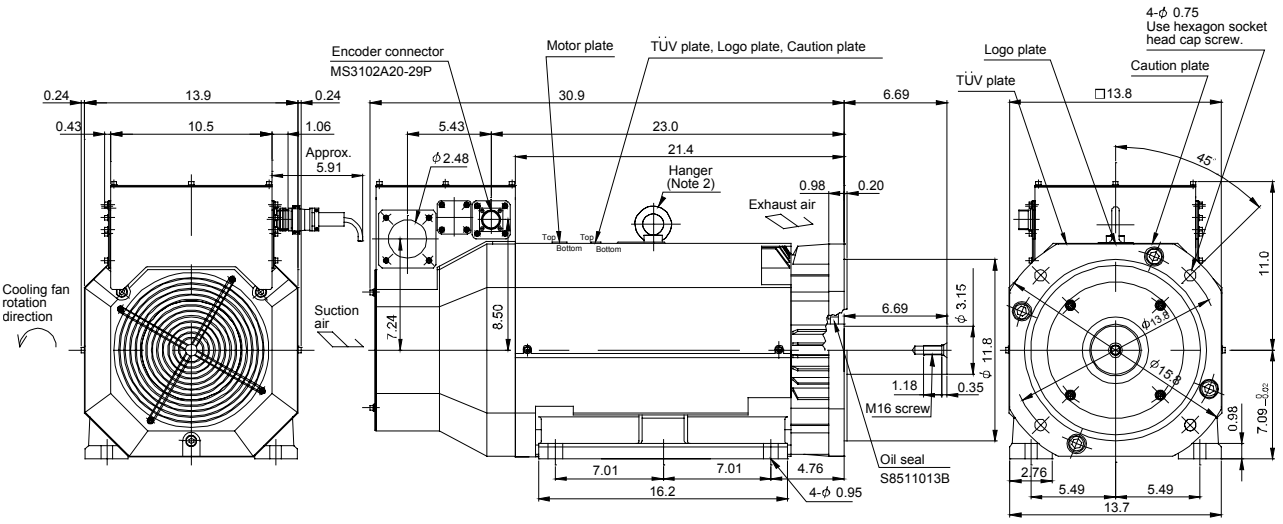


BC11371B
(BC13393B, BC13392*, BC13232*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS37K1 HA-LFS37K14	37	10224.12	738.55
HA-LFS50K1M4	50		

(Note 1)[Unit: in]



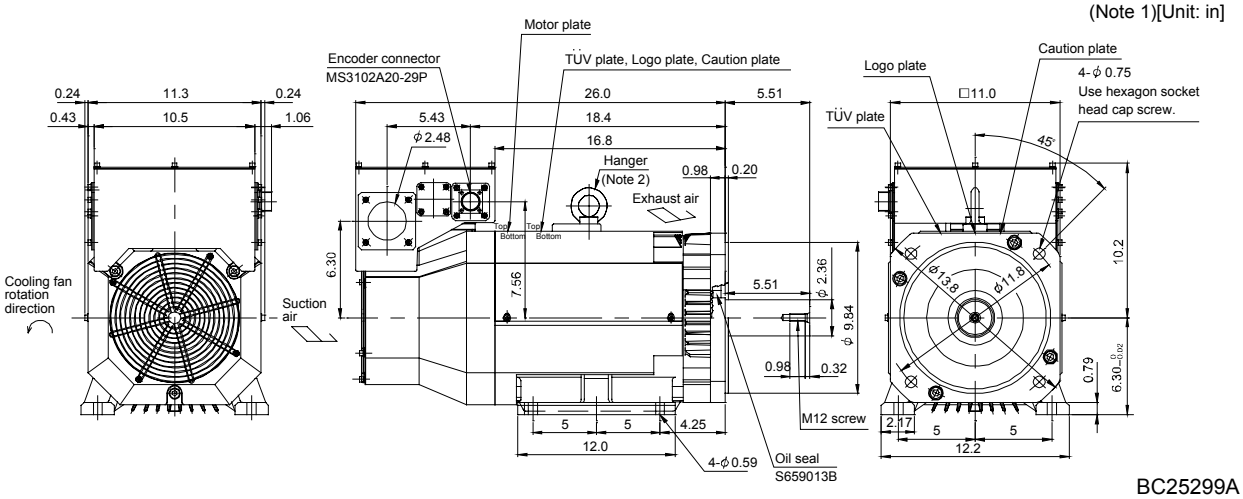
BC12221*
(BC13395B)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS30K1M	30	3553.84	396.83
HA-LFS37K2	37		

(Note 1)[Unit: in]

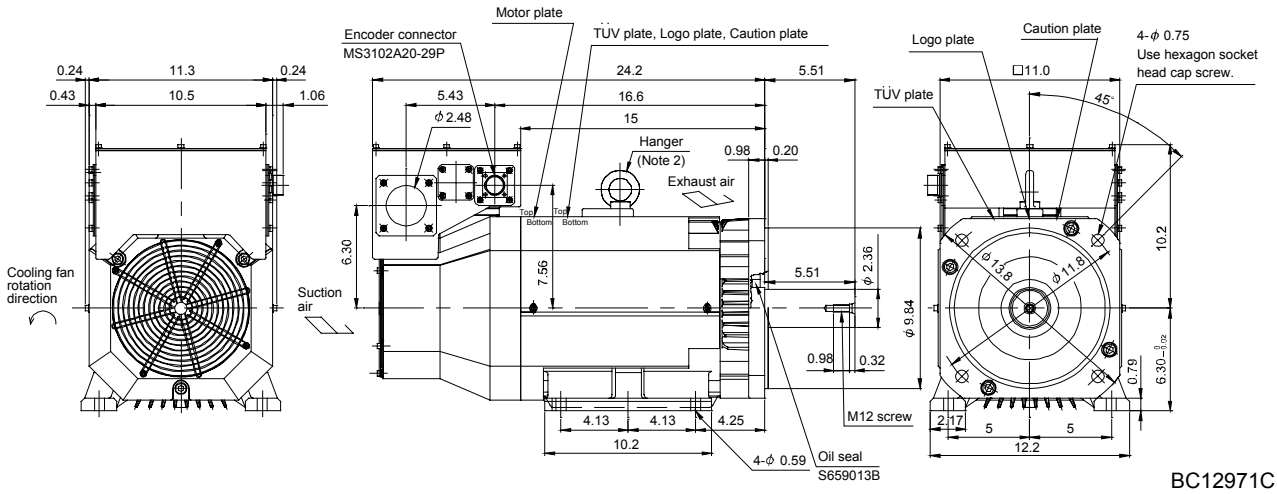


BC25299A

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS30K2	30	3007.1	352.74

(Note 1)[Unit: in]



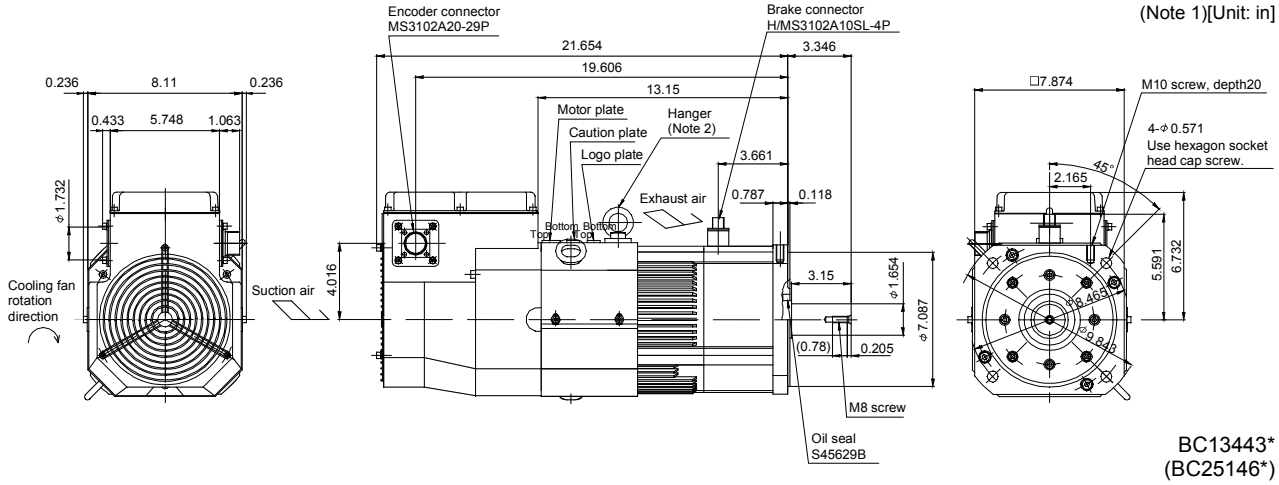
BC12971C

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

(2) With electromagnetic brake

Model	Output [kW]	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS601B HA-LFS6014B	6	11612	617.82	154.32
HA-LFS701MB HA-LFS701M4B	7			
HA-LFS11K2B HA-LFS11K24B	11			

(Note 1)[Unit: in]

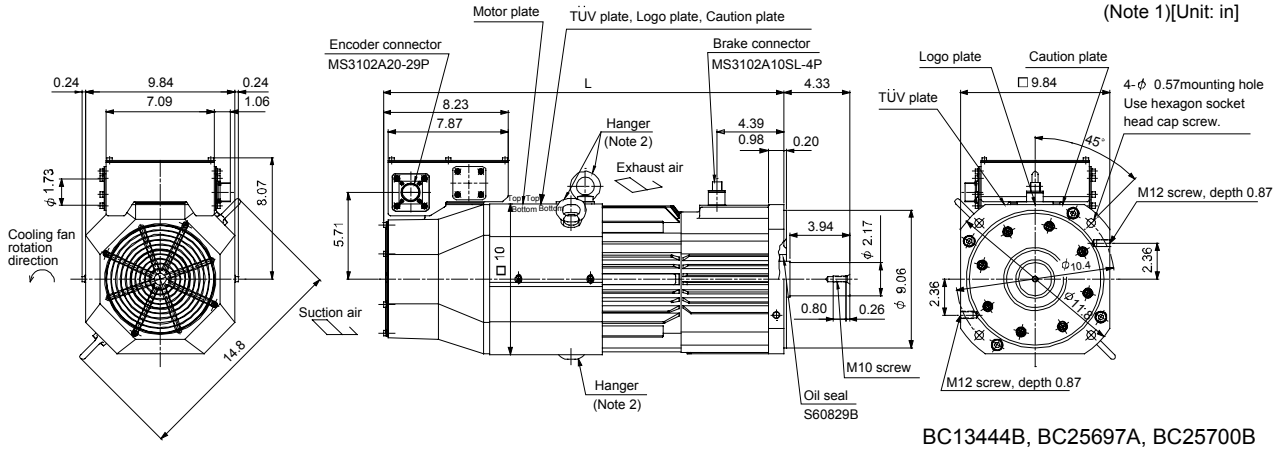


BC13443*
(BC25146*)

Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M10 × 20 mm or less.

Model	Output [kW]	Variable dimensions [in] L	Brake static friction torque [oz・in]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HA-LFS801B HA-LFS8014B	8	24.02	22729	1601.96	277.78
HA-LFS11K1MB HA-LFS11K1M4B	11				
HA-LFS15K2B HA-LFS15K24B	15				
HA-LFS12K1B HA-LFS12K14B	12	26.38		2017.49	321.88
HA-LFS15K1MB HA-LFS15K1M4B	15				
HA-LFS22K2B HA-LFS22K24B	22				

(Note 1)[Unit: in]



BC13444B, BC25697A, BC25700B
BC25746A, BC25767A, BC25865B
BC25985B, BC33030*, BC33034*

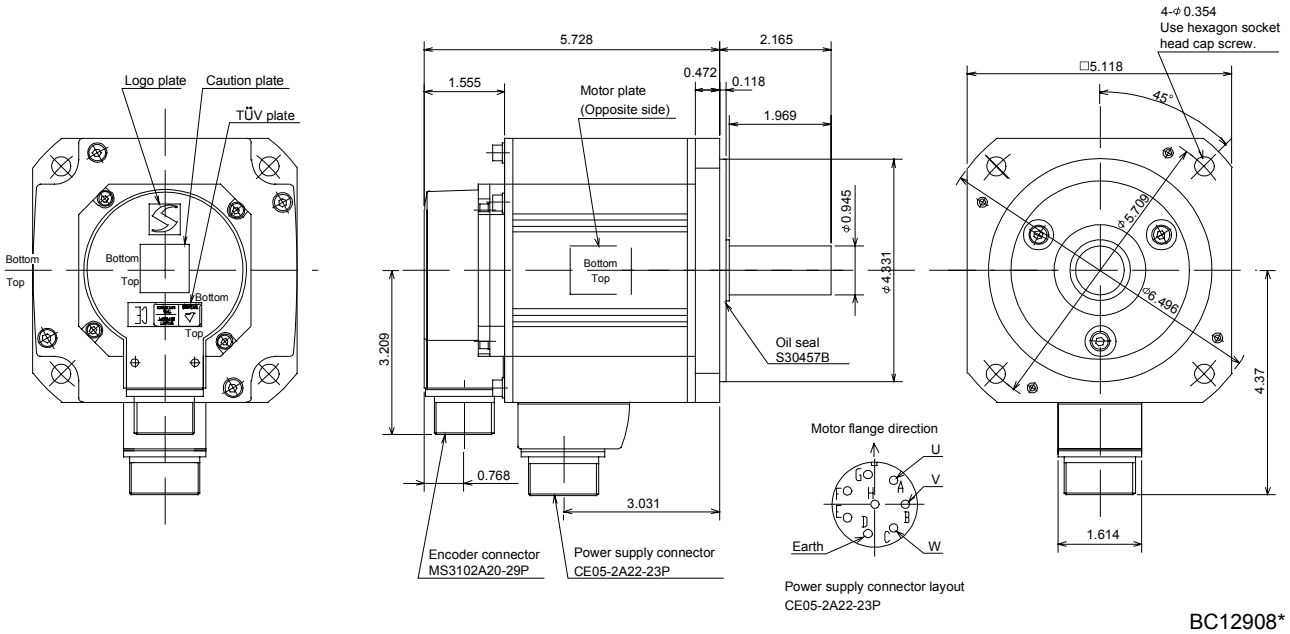
Note 1. The dimensions without tolerances are reference dimensions.
2. When the motor is used without the hanger, plug the threaded hole with a bolt of M16 × 20 mm or less.

7.2.14 HC-LFS series

(1) Standard (without electromagnetic brake)

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-LFS52	0.5	17.5	14.33

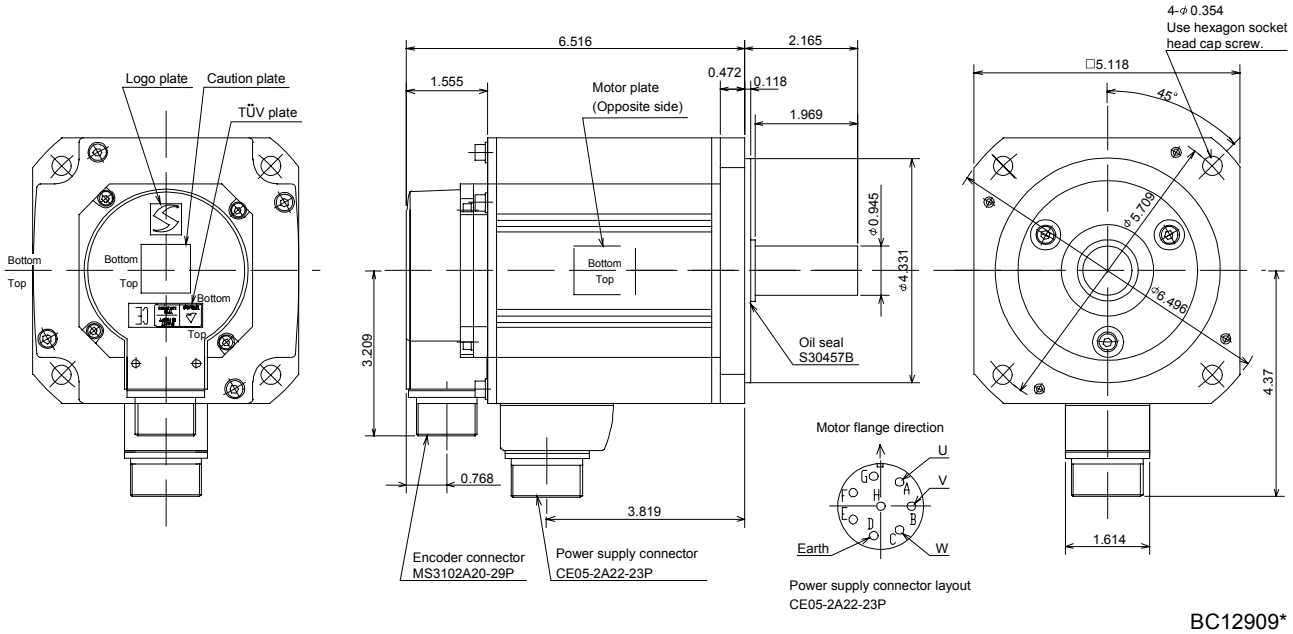
[Unit: in]



BC12908*

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-LFS102	1.0	25.15	17.64

[Unit: in]

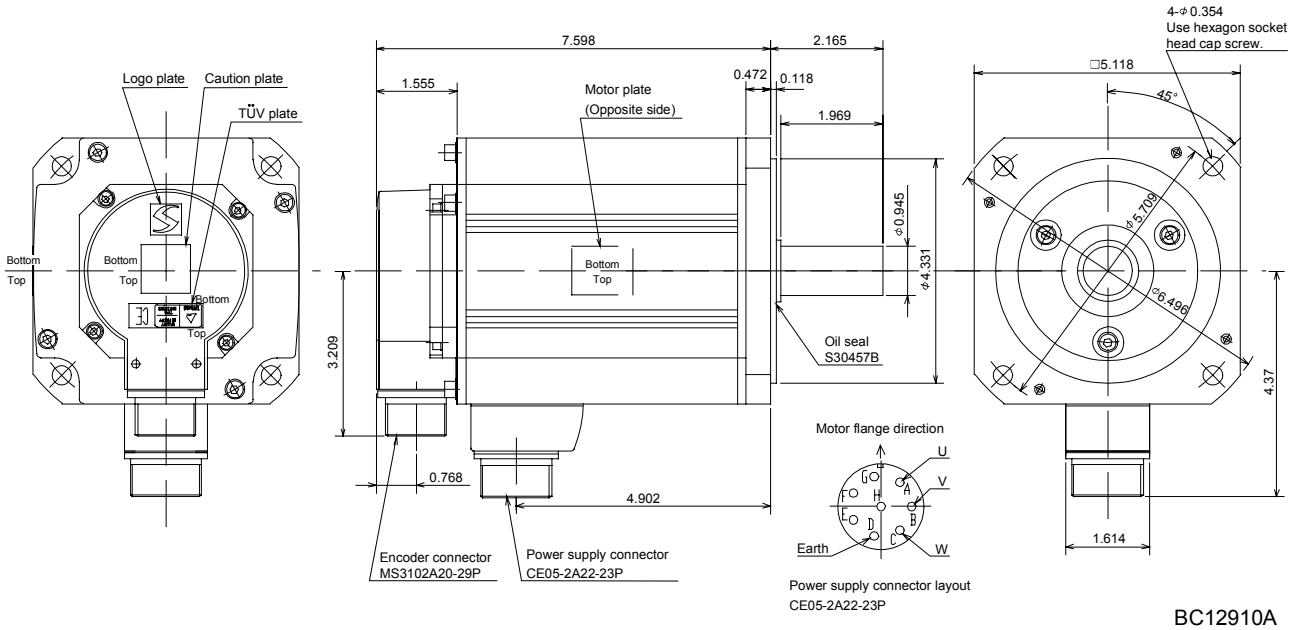


BC12909*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-LFS152	1.5	34.99	22.05

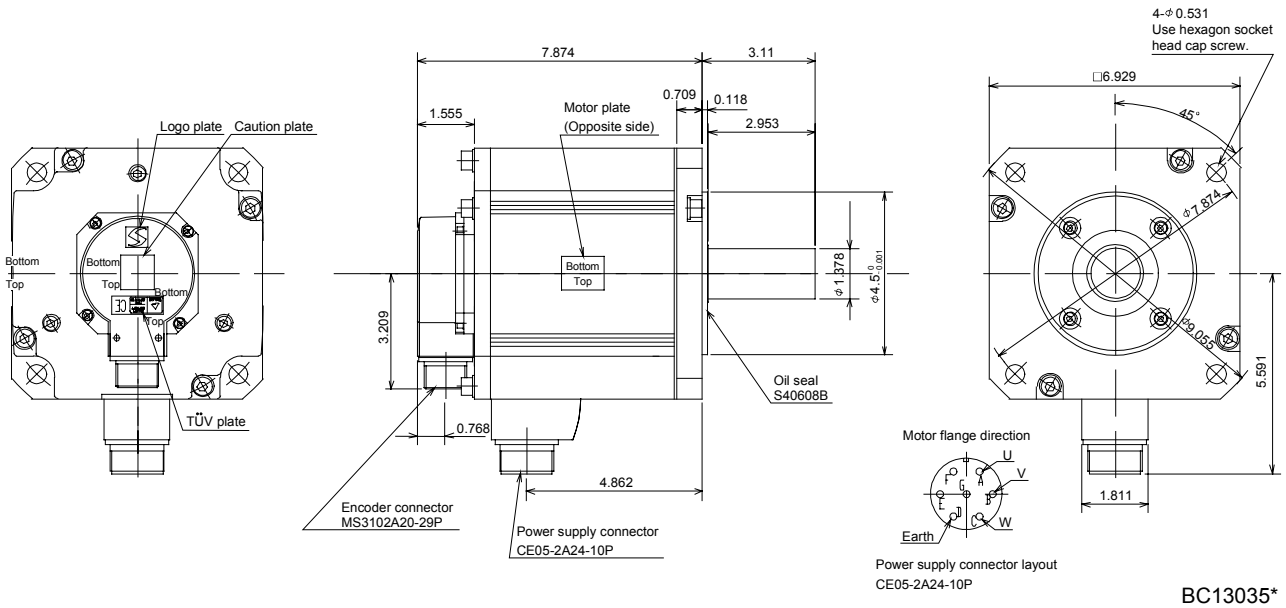
[Unit: in]



BC12910A

Model	Output [kW]	Inertia Moment WK^2[oz • in^2]	Mass [lb]
HC-LFS202	2.0	120.28	46.3

[Unit: in]

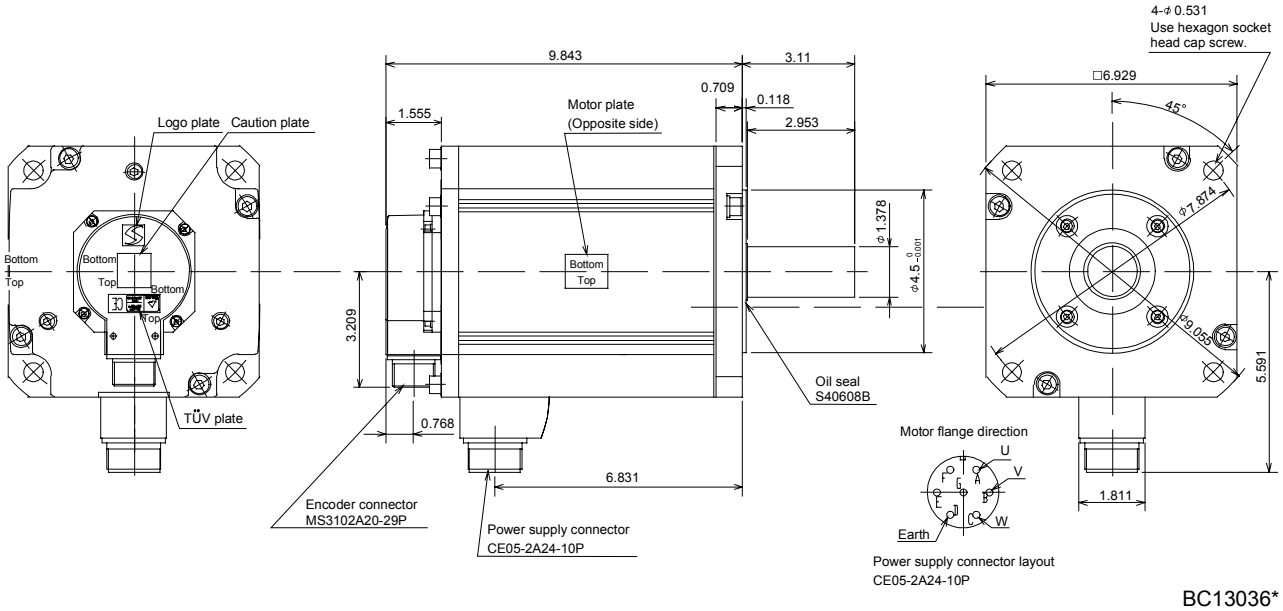


BC13035*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]
HC-LFS302	3.0	196.83	61.73

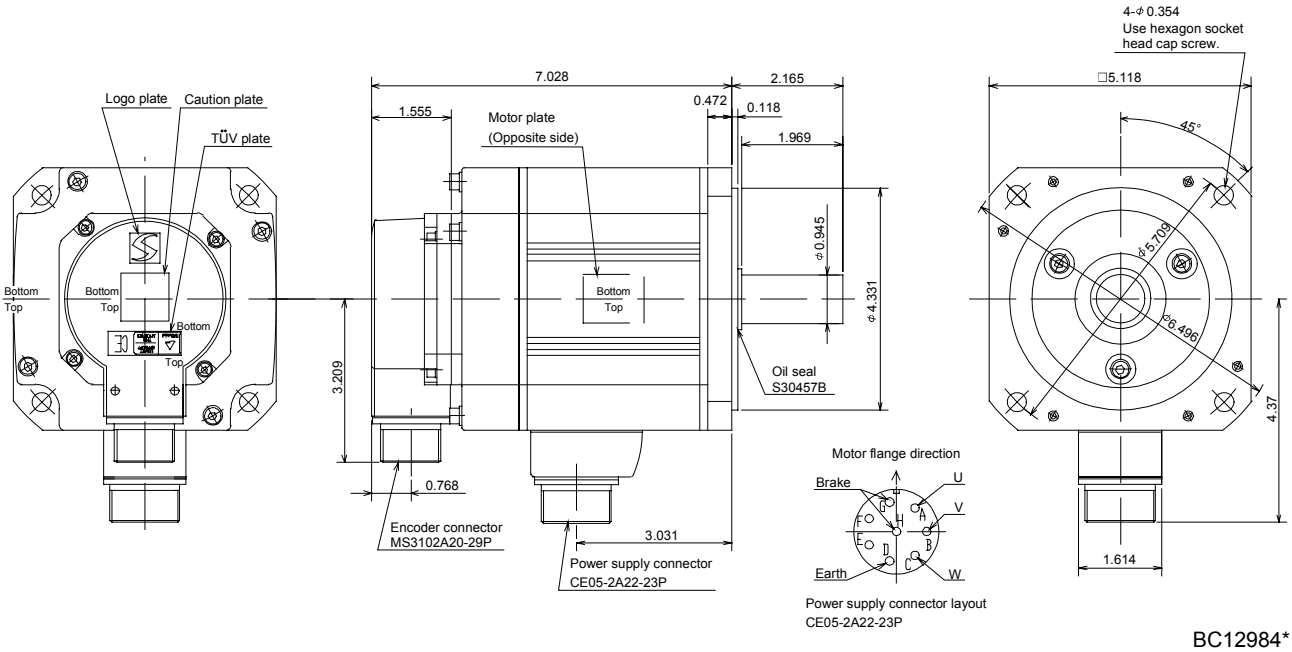
[Unit: in]



BC13036*

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [N・m]
HC-LFS52B	0.5	28.43	19.84	8.3

[Unit: in]

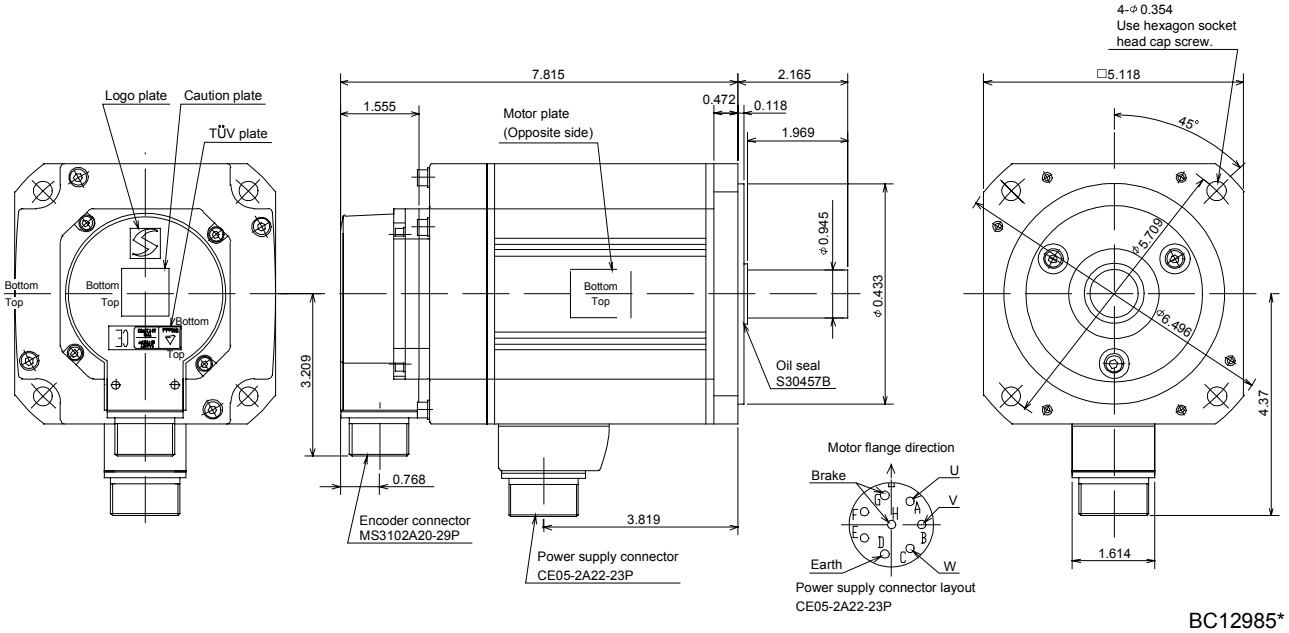


BC12984*

7. OUTLINE DIMENSION DRAWINGS

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [N・m]
HC-LFS102B	1.0	36.09	23.15	8.3

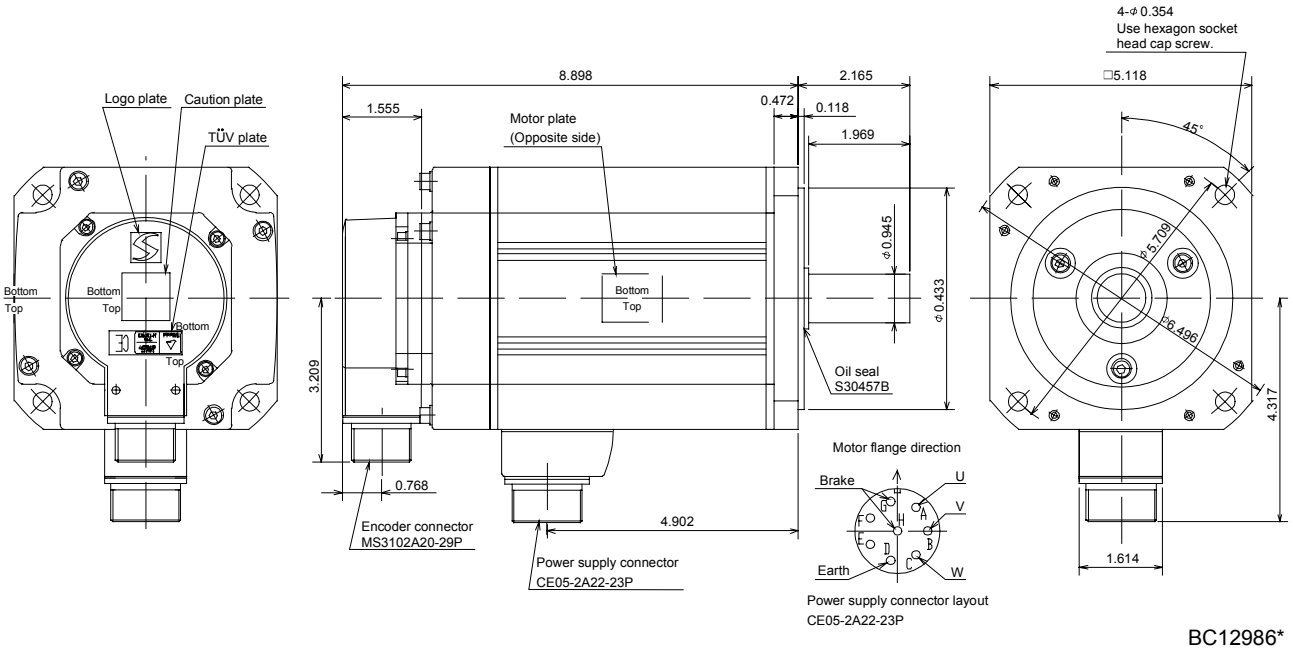
[Unit: in]



BC12985*

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [N・m]
HC-LFS152B	1.5	45.93	27.56	8.3

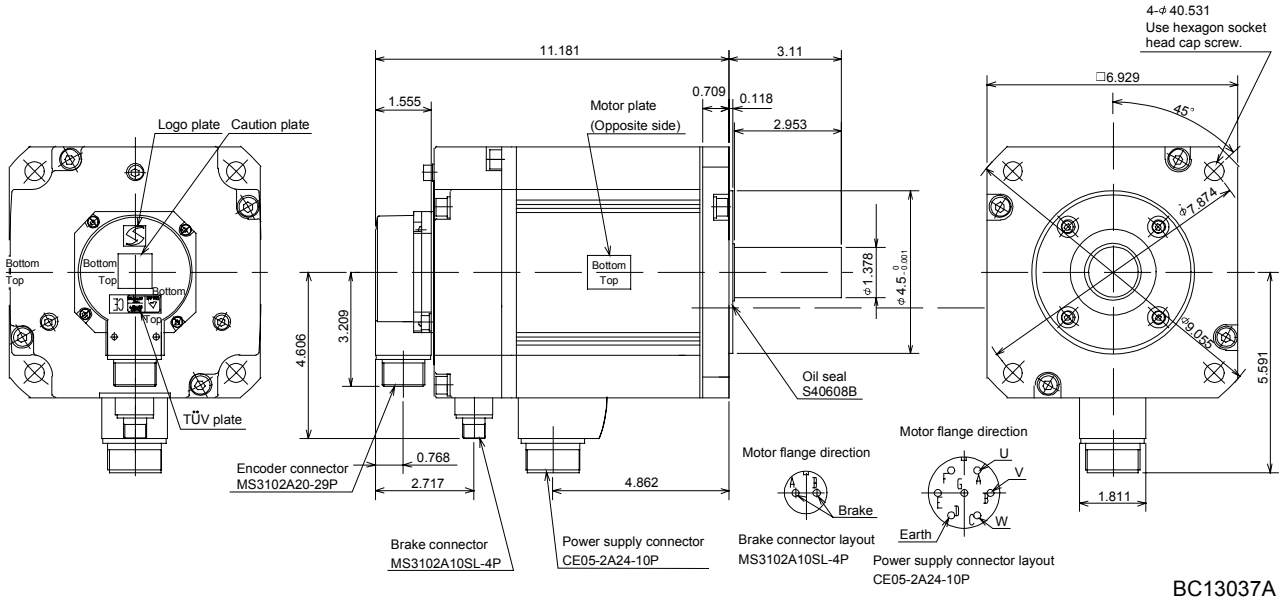
[Unit: in]



BC12986*

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [N・m]
HC-LFS202B	2.0	174.96	59.53	43.1

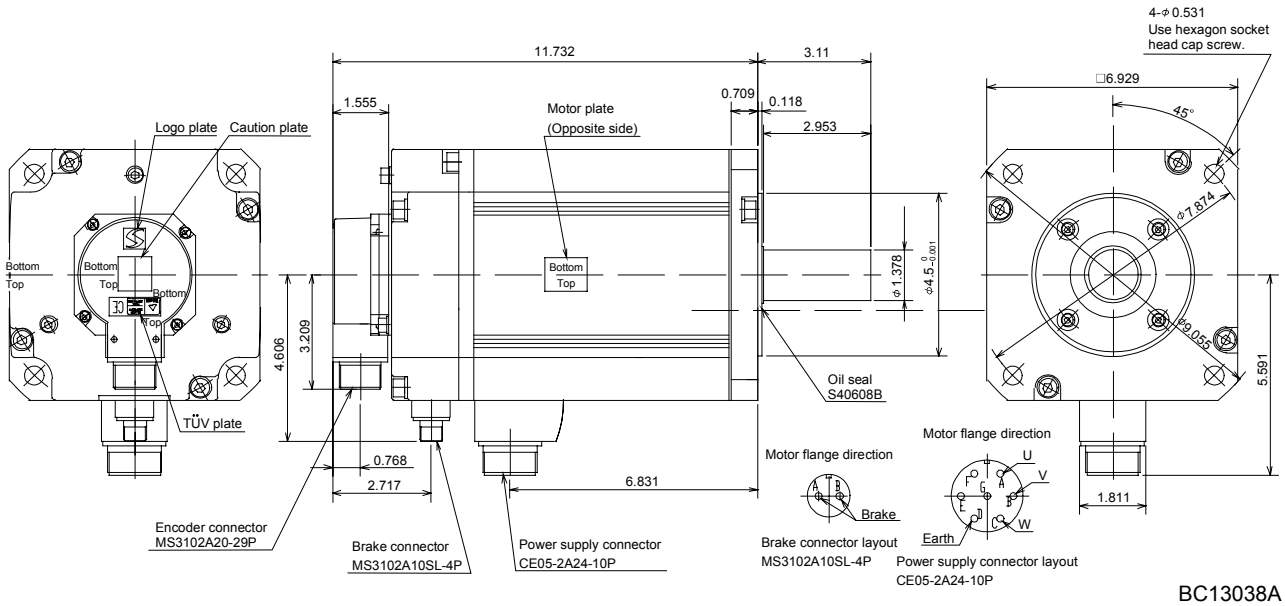
[Unit: in]



BC13037A

Model	Output [kW]	Inertia Moment WK^2[oz・in^2]	Mass [lb]	Brake static friction torque [N・m]
HC-LFS302B	3.0	251.5	74.96	43.1

[Unit: in]



BC13038A

7.3 Connector

(1) Coupler type

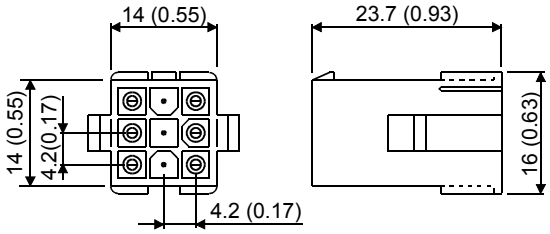
<AMP>

Model

Housing : 1-172161-9

Connector pin : 170359-1・170363-1 (loose piece)

Crimping tool : 755330-1



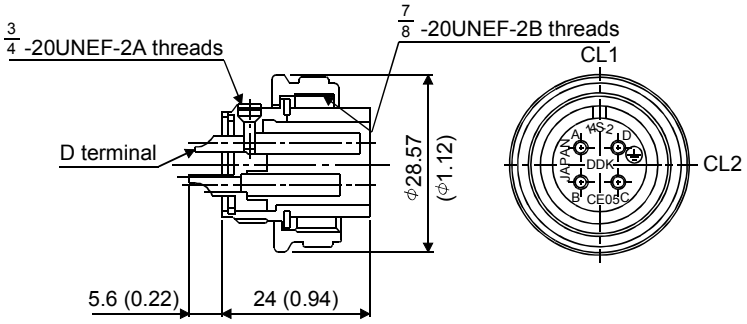
[Unit: mm]
([Unit: in])

(2) Cannon connector type

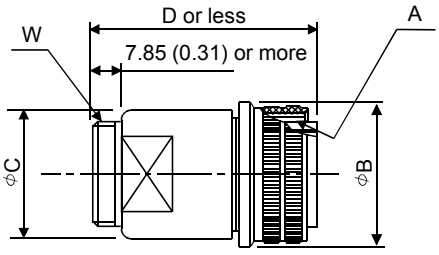
(a) Connectors

<DDK>

CE05-6A14S-2SD-D

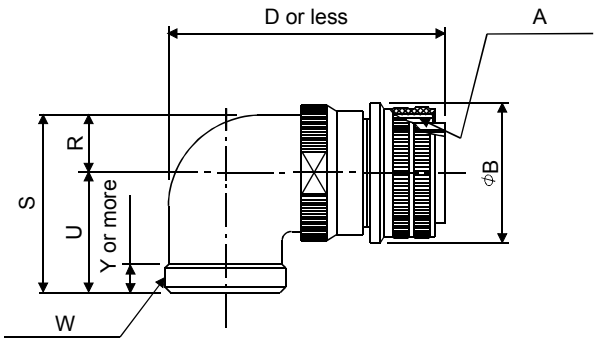


[Unit: mm]
([Unit: in])



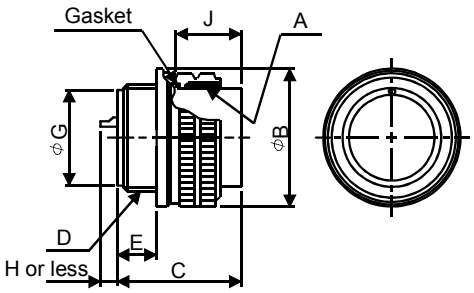
[Unit: mm]
([Unit: in])

Model	A	B	C	D	W
CE05-6A22-23SD-D-BSS	1 3/8-18UNEF-2B	40.48 (1.59)	38.3 (1.51)	61 (2.40)	1 3/16-18UNEF-2A
CE05-6A24-10SD-D-BSS	1 1/2-18UNEF-2B	43.63 (1.72)	42.0 (1.65)	68 (2.68)	1 7/16-18UNEF-2A
CE05-6A32-17SD-D-BSS	2-18UNS-2B	56.33 (2.22)	54.2 (2.13)	79 (3.11)	1 3/4-18UNS-2A



[Unit: mm]
([Unit: in])

Model	A	B	D	W	R	U	S	Y
CE05-8A22-23SD-D-BAS	1 3/8-18UNEF-2B	40.48 (1.59)	75.5 (2.97)	1 3/16-18UNEF-2A	16.3 (0.64)	33.3 (1.31)	49.6 (1.95)	7.5 (0.30)
CE05-8A24-10SD-D-BAS	1 1/2-18UNEF-2B	43.63 (1.72)	86.3 (3.40)	1 7/16-18UNEF-2A	18.2 (0.72)	36.5 (1.44)	54.7 (2.15)	7.5 (0.30)
CE05-8A32-17SD-D-BAS	2-18UNS-2B	56.33 (2.22)	93.5 (3.68)	1 3/4-18UNS-2A	24.6 (0.97)	44.5 (1.75)	61.9 (2.44)	8.5 (0.34)

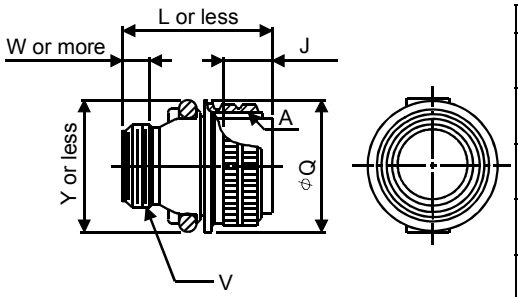


[Unit: mm]
([Unit: in])

Model	A	B	C	D	E	G	J
D/MS3106A10SL-4S(D190)	5/8-24UNEF-2B	22.22 (0.87)	23.3 (0.92)	9/16-24UNEF-2A	7.5 (0.30)	12.5 (0.49)	13.49 (0.53)
D/MS3106A14S-2S(D190)	7/8-20UNEF-2B	28.57 (1.13)	24.34 (0.96)	3/4-20UNEF-2A	8.46 (0.33)	17.0 (0.67)	13.49 (0.53)
D/MS3106A20-29S(D190)	1 1/4-18UNEF-2B	37.28 (1.47)	34.11 (1.34)	1 1/8-18UNEF-2A	12.16 (0.48)	26.8 (1.06)	18.26 (0.72)
D/MS3106A22-23S(D190)	1 3/8-18UNEF-2B	40.48 (1.59)	34.11 (1.34)	1 1/4-18UNEF-2A	12.15 (0.48)	29.9 (1.18)	18.26 (0.72)
D/MS3106A24-10S(D190)	1 1/2-18UNEF-2B	43.63 (1.72)	36.58 (1.44)	1 3/8-18UNEF-2A	13.42 (0.53)	32.9 (1.30)	18.26 (0.72)
D/MS3106A32-17S(D190)	2-18UNS-2B	56.33 (2.22)	36.95 (1.46)	1 7/8-16UN-2A	13.14 (0.52)	45.3 (1.78)	18.26 (0.72)

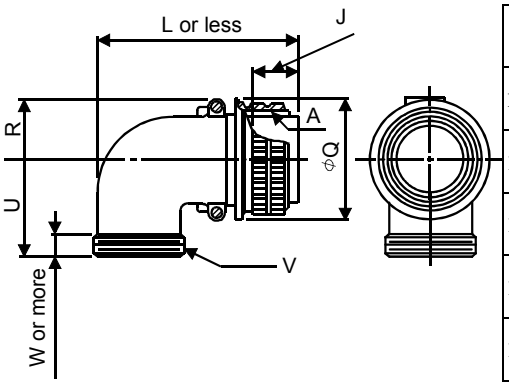
	Contact Size				
	#16	#12	#8	#4	#0
H	8 or less	8 or less	10 or less	13 or less	13 or less

[Unit: mm]
([Unit: in])



Model	A	J	L	Q	V	W	Y
D/MS3106B14S-2S	7/8-20UNEF	13.49 (0.53)	42.88 (1.69)	28.57 (1.13)	3/4-20UNEF	8.0 (0.32)	30 (1.18)
D/MS3106B20-29S	1 1/4-18UNEF	18.26 (0.72)	55.57 (2.19)	37.28 (1.47)	1 3/16-18UNEF	9.53 (0.38)	47 (1.85)
D/MS3106B22-23S	1 3/8-18UNEF	18.26 (0.72)	55.57 (2.19)	40.48 (1.59)	1 3/16-18UNEF	9.53 (0.38)	50 (1.97)
D/MS3106B24-10S	1 1/2-18UNEF	18.26 (0.72)	58.72 (2.31)	43.63 (1.72)	1 7/16-18UNEF	9.53 (0.38)	53 (2.09)
D/MS3106B32-17S	2-18UNS	18.26 (0.72)	61.92 (2.44)	56.33 (2.22)	1 3/4-18UNS	11.13 (0.44)	66 (2.60)

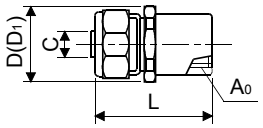
[Unit: mm]
([Unit: in])



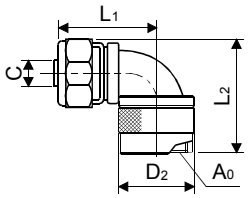
Model	A	J	L	Q	R	U	V	W
D/MS3108B14S-2S	7/8-20UNEF	13.49 (0.53)	53.97 (2.13)	28.57 (1.13)	14.9 (0.59)	27.0 (1.06)	3/4-20UNEF	9.53 (0.38)
D/MS3108B20-29S	1 1/4-18UNEF	18.26 (0.72)	76.98 (3.03)	37.28 (1.47)	22.5 (0.89)	33.3 (1.31)	1 3/16-18UNEF	9.53 (0.38)
D/MS3108B22-23S	1 3/8-18UNEF	18.26 (0.72)	76.98 (3.03)	40.48 (1.59)	24.1 (0.95)	33.3 (1.31)	1 3/16-18UNEF	9.53 (0.38)
D/MS3108B24-10S	1 1/2-18UNEF	18.26 (0.72)	86.51 (3.41)	43.63 (1.72)	25.6 (1.01)	36.5 (1.44)	1 7/16-18UNEF	9.53 (0.38)
D/MS3108B32-17S	2-18UNS	18.26 (0.72)	95.25 (3.75)	56.33 (2.22)	32.8 (1.29)	44.4 (1.75)	1 3/4-18UNS	11.13 (0.44)

(b) Flexible conduit connectors
<Daiwa Dengyo>

MSA



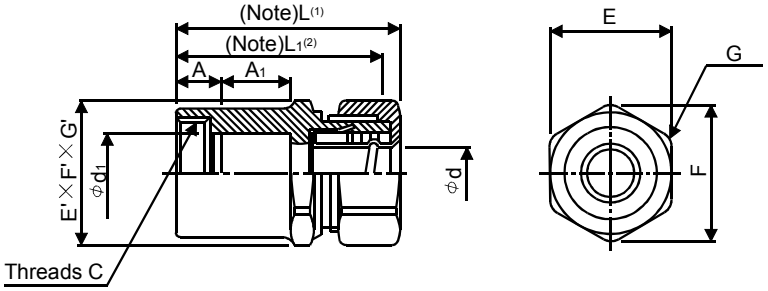
MAA



[Unit: mm]
([Unit: in])

Model	A_0	C	L	L_1	L_2	D	D_1	D_2
MSA-10-10・MAA-10-10	9/16-24UNEF-2B	8.2 (0.32)	44 (1.73)	35.5 (1.40)	45 (1.77)	27 (1.06)	29 (1.14)	26 (1.02)
MSA-10-14・MAA-10-14	3/4-20UNEF-2B	8.2 (0.32)	45 (1.77)	39.5 (1.56)	46 (1.18)	27 (1.06)	29 (1.14)	35 (1.38)
MSA-12-14・MAA-12-14	3/4-20UNEF-2B	10.7 (0.42)	45 (1.77)	39.5 (1.56)	46 (1.18)	27 (1.06)	29 (1.14)	35 (1.38)
MSA-16-20・MAA-16-20	1 1/8-18UNEF-2B	14 (0.55)	49.5 (1.95)	47 (1.85)	52 (2.05)	36 (1.42)	38 (1.50)	39 (1.54)
MSA-16-22・MAA-16-22	1 1/4-18UNEF-2B	14 (0.55)	49.5 (1.95)	47 (1.85)	52 (2.05)	38 (1.50)	42 (1.65)	39 (1.54)
MSA-16-24・MAA-16-24	1 3/8-18UNEF-2B	14 (0.55)	49.5 (1.95)	51 (2.01)	54 (2.13)	41 (1.61)	43 (1.69)	47 (1.85)
MSA-22-20・MAA-22-20	1 1/8-18UNEF-2B	18.9 (0.74)	49.5 (1.95)	47 (1.85)	54 (2.13)	36 (1.42)	39 (1.54)	39 (1.54)
MSA-22-22・MAA-22-22	1 1/4-18UNEF-2B	18.9 (0.74)	49.5 (1.95)	47 (1.85)	54 (2.13)	38 (1.50)	42 (1.65)	39 (1.54)
MSA-22-24・MAA-22-24	1 3/8-18UNEF-2B	18.9 (0.74)	49.5 (1.95)	51 (2.01)	56 (2.21)	41 (1.61)	43 (1.69)	47 (1.85)
MSA-28-22・MAA-28-22	1 1/4-18UNEF-2B	24.5 (0.97)	51 (2.01)	53 (2.09)	64 (2.52)	46 (1.18)	50 (1.97)	47 (1.85)
MSA-28-24・MAA-28-24	1 3/8-18UNEF-2B	24.5 (0.97)	51 (2.01)	53 (2.09)	66 (2.60)	46 (1.18)	50 (1.97)	47 (1.85)

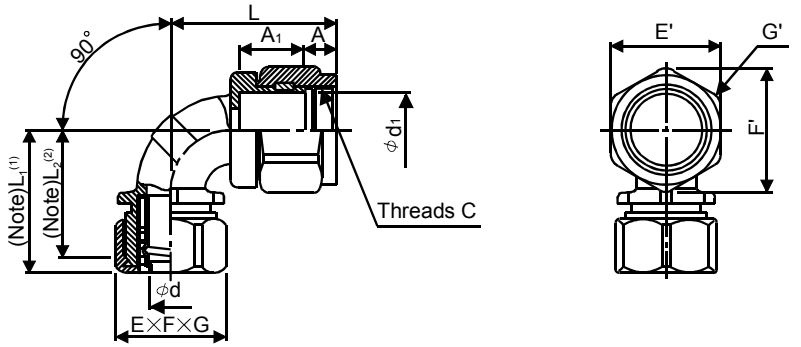
7. OUTLINE DIMENSION DRAWINGS



[Unit: mm]
([Unit: in])

Model	Threads C	A	A_1	d	d_1	Jam Nut			Lock Nut			L	L_1
						E Width Across Flats	F Width Across Corners	G Number Of Corners	E' Width Across Flats	F' Width Across Corners	G' Number Of Corners		
RCC-102RL-MS10F	9/16-24UNEF-2B	6 (0.24)	15 (0.59)	8.3 (0.33)	11.0 (0.43)	24 (0.95)	26.4 (1.04)	6	24 (0.95)	26.4 (1.04)	6	39 (1.54)	36 (1.42)
RCC-102RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	8.3 (0.33)	15.0 (0.59)	24 (0.95)	26.4 (1.04)	6	24 (0.95)	26.4 (1.04)	6	40 (1.58)	37 (1.46)
RCC-103RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	10.6 (0.42)	15.0 (0.59)	27 (1.06)	29.7 (1.17)	6	26 (1.02)	28.6 (1.13)	6	44 (1.73)	41 (1.61)
RCC-104RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	14.0 (0.55)	15.0 (0.59)	30 (1.18)	33.0 (1.30)	6	30 (1.18)	33.0 (1.30)	6	45 (1.77)	42 (1.65)
RCC-104RL-MS20F	1 1/8-18UNEF-2B	9 (0.35)	15 (0.59)	14.0 (0.55)	24.0 (0.95)	30 (1.18)	33.0 (1.30)	6	32 (1.26)	35.2 (1.39)	6	47 (1.85)	44 (1.73)
RCC-104RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	14.0 (0.55)	27.0 (1.06)	30 (1.18)	33.0 (1.30)	6	36 (1.42)	39.6 (1.56)	6	47 (1.85)	44 (1.73)
RCC-104RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	14.0 (0.55)	30.0 (1.18)	30 (1.18)	33.0 (1.30)	6	40 (1.58)	42.5 (1.67)	8	54 (2.13)	50 (1.97)
RCC-106RL-MS20F	1 1/8-18UNEF-2B	9 (0.35)	15 (0.59)	19.0 (0.75)	24.0 (0.95)	37 (1.46)	40.7 (1.60)	6	36 (1.42)	39.6 (1.56)	6	50 (1.97)	46 (1.81)
RCC-106RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	19.0 (0.75)	27.0 (1.06)	37 (1.46)	40.7 (1.60)	6	36 (1.42)	39.6 (1.56)	6	50 (1.97)	46 (1.81)
RCC-106RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	19.0 (0.75)	30.0 (1.18)	37 (1.46)	40.7 (1.60)	6	40 (1.58)	42.5 (1.67)	8	56 (2.21)	52 (2.05)
RCC-106RL-MS32F	1 7/8-16UN-2B	11 (0.43)	20 (0.79)	19.0 (0.75)	42.5 (1.67)	37 (1.46)	40.7 (1.60)	6	52 (2.05)	54.5 (2.15)	8	57 (2.24)	53 (2.09)
RCC-108RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	24.4 (0.96)	27.0 (1.06)	45 (1.77)	47.3 (1.86)	8	44 (1.73)	46.3 (1.82)	8	55 (2.17)	50 (1.97)
RCC-108RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	24.4 (0.96)	30.0 (1.18)	45 (1.77)	47.3 (1.86)	8	44 (1.73)	46.3 (1.82)	8	60 (2.36)	55 (2.17)
RCC-108RL-MS32F	1 7/8-16UN-2B	11 (0.43)	20 (0.79)	24.4 (0.96)	42.5 (1.67)	45 (1.77)	47.3 (1.86)	8	52 (2.05)	54.5 (2.15)	8	61 (2.40)	56 (2.21)

Note: (1) indicates the reference dimension before assembling, and (2) the reference dimension after assembling.



[Unit: mm]
([Unit: in])

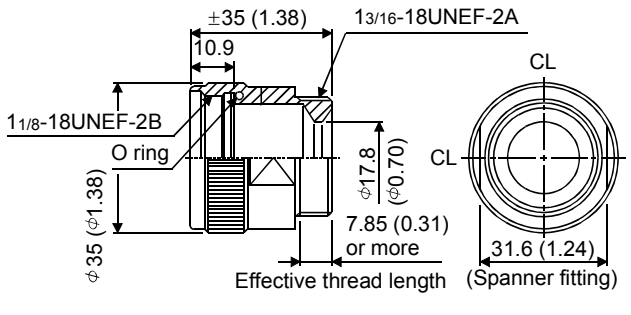
Model	Threads C	A	A1	d	d1	Jam Nut			Lock Nut			L	L1	L2
						E Width Across Flats	F Width Across Corners	G Number Of Corners	E' Width Across Flats	F' Width Across Corners	G' Number Of Corners			
RCC-302RL-MS10F	9/16-24UNEF-2B	6 (0.24)	15 (0.59)	8.3 (0.33)	10.0 (0.39)	24 (0.95)	26.4 (1.04)	6	20 (0.79)	22.0 (0.87)	6	35 (1.38)	33 (1.30)	30 (1.18)
RCC-302RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	8.3 (0.33)	13.8 (0.54)	24 (0.95)	26.4 (1.04)	6	23 (0.91)	25.3 (1.0)	6	35 (1.38)	33 (1.30)	30 (1.18)
RCC-303RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	10.6 (0.42)	13.8 (0.54)	27 (1.06)	29.7 (1.17)	6	23 (0.91)	25.3 (1.0)	6	37 (1.46)	37 (1.46)	34 (1.34)
RCC-304RL-MS14F	3/4-20UNEF-2B	7 (0.28)	15 (0.59)	14.0 (0.55)	13.8 (0.54)	30 (1.18)	33.0 (1.30)	6	23 (0.91)	25.3 (1.0)	6	39 (1.54)	38 (1.50)	35 (1.38)
RCC-304RL-MS20F	1 1/8-18UNEF-2B	9 (0.35)	15 (0.59)	14.0 (0.55)	23.2 (0.91)	30 (1.18)	33.0 (1.30)	6	32 (1.26)	35.2 (1.39)	6	41 (1.61)	38 (1.50)	35 (1.38)
RCC-304RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	14.0 (0.55)	26.5 (1.04)	30 (1.18)	33.0 (1.30)	6	36 (1.42)	39.6 (1.56)	6	41 (1.61)	38 (1.50)	35 (1.38)
RCC-304RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	14.0 (0.55)	28.7 (1.13)	30 (1.18)	33.0 (1.30)	6	40 (1.58)	42.5 (1.67)	8	47 (1.85)	46 (1.81)	43 (1.69)
RCC-306RL-MS20F	1 1/8-18UNEF-2B	9 (0.35)	15 (0.59)	19.0 (0.75)	23.2 (0.91)	37 (1.46)	40.7 (1.60)	6	32 (1.26)	35.2 (1.39)	6	45 (1.77)	44 (1.73)	40 (1.58)
RCC-306RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	19.0 (0.75)	26.5 (1.04)	37 (1.46)	40.7 (1.60)	6	36 (1.42)	39.6 (1.56)	6	45 (1.77)	44 (1.73)	40 (1.58)
RCC-306RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	19.0 (0.75)	28.7 (1.13)	37 (1.46)	40.7 (1.60)	6	40 (1.58)	42.5 (1.67)	8	51 (2.01)	49 (1.93)	45 (1.77)
RCC-306RL-MS32F	1 7/8-16UN-2B	11 (0.43)	20 (0.79)	19.0 (0.75)	40.6 (1.60)	37 (1.46)	40.7 (1.60)	6	54 (2.13)	56.7 (2.23)	8	52 (2.05)	49 (1.93)	45 (1.77)
RCC-308RL-MS22F	1 1/4-18UNEF-2B	9 (0.35)	15 (0.59)	24.4 (0.96)	26.5 (1.04)	45 (1.77)	47.3 (1.86)	8	36 (1.42)	39.6 (1.56)	6	49 (1.93)	50 (1.97)	45 (1.77)
RCC-308RL-MS24F	1 3/8-18UNEF-2B	10 (0.39)	20 (0.79)	24.4 (0.96)	28.7 (1.13)	45 (1.77)	47.3 (1.86)	8	40 (1.58)	42.5 (1.67)	8	56 (2.21)	50 (1.97)	45 (1.77)
RCC-308RL-MS32F	1 7/8-16UN-2B	11 (0.43)	20 (0.79)	24.4 (0.96)	40.6 (1.60)	45 (1.77)	47.3 (1.86)	8	54 (2.13)	56.7 (2.23)	8	62 (2.44)	50 (1.97)	45 (1.77)

Note: (1) indicates the reference dimension before assembling, and (2) the reference dimension after assembling.

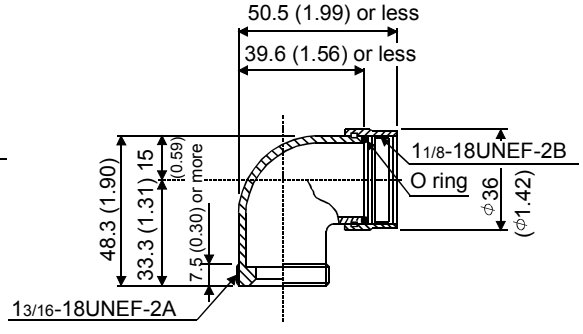
(c) Back shell

<DDK>

CE02-20BS-S-D

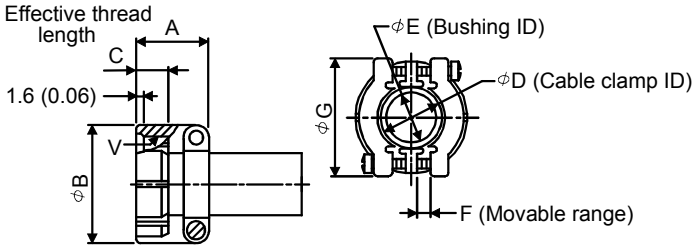


CE-20BA-S-D



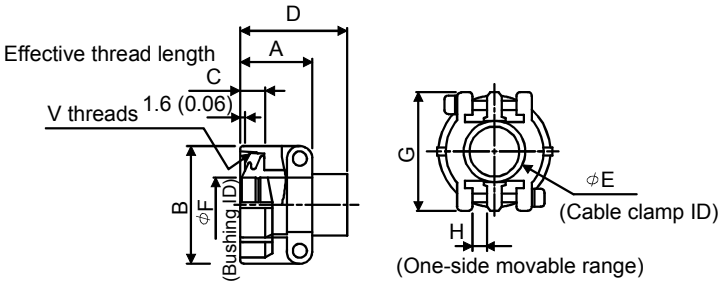
(d) Cable clamps

<DDK>



[Unit: mm]
([Unit: in])

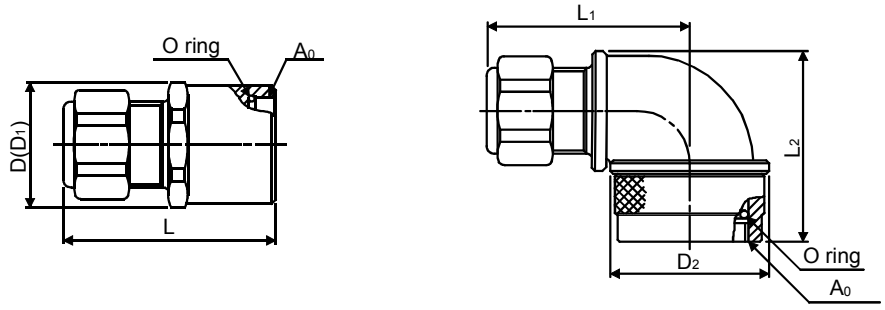
Model	Shell Size	A	B	C	D	E	F	G	V	Bushing
D/MS3057-6A	14S	22.2 (0.87)	24.6 (0.97)	10.3 (0.41)	11.2 (0.44)	7.9 (0.31)	2.0 (0.08)	27.0 (1.06)	3/4-20UNEF	AN3420-6
D/MS3057-12A	20・22	23.8 (0.94)	35.0 (1.38)	10.3 (0.41)	19.0 (0.75)	15.9 (0.63)	4.0 (0.16)	37.3 (1.47)	1 3/16-18UNEF	AN3420-12
D/MS3057-16A	24・28	26.2 (1.03)	42.1 (1.66)	10.3 (0.41)	23.8 (0.94)	15.9 (0.63) 19.1 (0.75)	4.8 (0.19)	42.9 (1.69)	1 7/16-18UNEF	AN3420-12 AN3420-16
D/MS3057-20A	32	27.8 (1.09)	51.6 (2.03)	11.9 (0.47)	31.7 (1.25)	19.1 (0.75) 23.8 (0.94)	6.3 (0.25)	51.6 (2.03)	1 3/4-18UNS	AN3420-16 AN3420-20



[Unit: mm]
([Unit: in])

Model	Shell Size	A	B	C	D	E	F	G	H	V	Bushing	Cable Range
CE3057-12A-1-D	20・22	23.8 (0.94)	35.0 (1.38)	10.3 (0.41)	41.3 (1.63)	19.0 (0.75)	16 (0.63)	37.3 (1.47)	4 (0.16)	1 3/16-18UNEF-2B	CE3420-12-1	ϕ12.5 to ϕ16
CE3057-12A-2-D							13 (0.51)				CE3420-12-2	ϕ9.5 to ϕ13
CE3057-12A-3-D							10 (0.39)				CE3420-12-3	ϕ6.8 to ϕ10
CE3057-16A-1-D	24	26.2 (1.03)	42.1 (1.66)	10.3 (0.41)	41.3 (1.63)	23.8 (0.94)	19.1 (0.75)	42.9 (1.69)	4.8 (0.19)	1 7/16-18UNEF-2B	CE3420-16-1	ϕ15 to ϕ19.1
CE3057-16A-2-D							15.5 (0.61)				CE3420-16-2	ϕ13 to ϕ15.5
CE3057-20A-1-D	32	27.8 (1.09)	51.6 (2.03)	11.9 (0.47)	43 (1.69)	31.7 (1.25)	23.8 (0.94)	51.6 (2.03)	6.3 (0.25)	1 3/4-18UNS-2B	CE3420-20-1	ϕ22 to ϕ23.8

<Daiwa Dengyo>

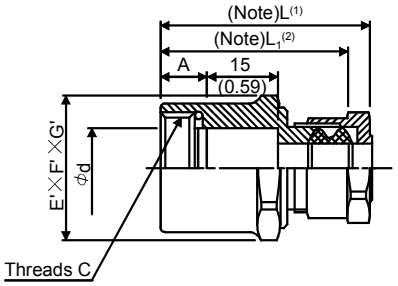


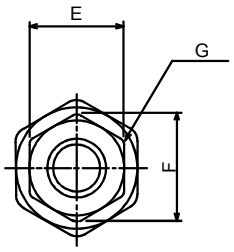
[Unit: mm]
([Unit: in])

Model	Acceptable OD	A0	L	L1	L2	D	D1	D2
YSO10-5 to 8・YLO10-5 to 8	ϕ5 to 8.3 (ϕ0.20 to 0.33)	9/16-24UNEF-2B	43 (1.69)	39 (1.54)	42.5 (1.67)	24 (0.94)	26 (1.02)	26 (1.02)
YSO14-5 to 8・YLO14-5 to 8	ϕ5 to 8.3 (ϕ0.20 to 0.33)	3/4-20UNEF-2B	44 (1.73)	43.5 (1.71)	44.5 (1.75)	26 (1.02)	28 (1.10)	35 (1.38)
YSO14-9 to 11・YLO14-9 to 11	ϕ8.3 to 11.3 (ϕ0.33 to 0.45)							

7. OUTLINE DIMENSION DRAWINGS

<Nippon Flex>

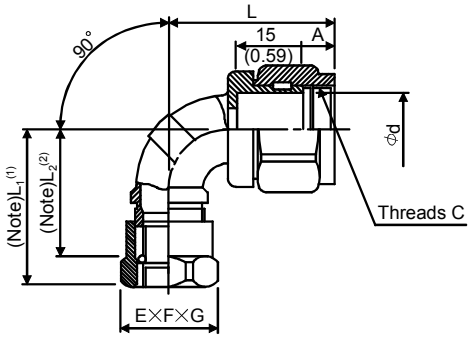


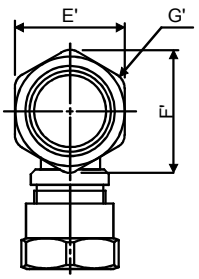


[Unit: mm]
([Unit: in])

Model	Threads C	Applicable Cable Diameter	A	d	Tightening Nut			Nipple Body			L	L1
					E Width Across Flats	F Width Across Corners	G Number Of Corners	E' Width Across Flats	F' Width Across Corners	G' Number Of Corners		
ACS-08RL-MS10F	9/16-24UNEF-2B	φ4.0 to φ8.0 (φ0.16 to 0.32)	6 (0.24)	11.0 (0.43)	20 (0.79)	22.0 (0.87)	6	20 (0.79)	22.0 (0.87)	6	45 (1.77)	40 (1.57)
ACS-08RL-MS14F	3/4-20UNEF-2B	φ4.0 to φ8.0 (φ0.16 to 0.32)	7 (0.28)	15.0 (0.59)	20 (0.79)	22.0 (0.87)	6	22 (0.87)	24.2 (0.95)	6	46 (1.81)	41 (1.61)
ACS-12RL-MS10F	9/16-20UNEF-2B	φ8.0 to φ12.0 (φ0.32 to 0.47)	6 (0.24)	11.0 (0.43)	24 (0.94)	26.4 (1.04)	6	24 (0.94)	26.4 (1.04)	6	46 (1.81)	41 (1.61)
ACS-12RL-MS14F	3/4-20UNEF-2B	φ8.0 to φ12.0 (φ0.32 to 0.47)	7 (0.28)	15.0 (0.59)	24 (0.94)	26.4 (1.04)	6	36 (1.42)	28.6 (1.13)	6	46 (1.81)	41 (1.61)

Note: (1) indicates the reference dimension before assembling, and (2) the reference dimension after assembling.





[Unit: mm]
([Unit: in])

Model	Threads C	Applicable Cable Diameter	A	d	Tightening Nut			Nipple Body			L	L1	L2
					E Width Across Flats	F Width Across Corners	G Number Of Corners	E' Width Across Flats	F' Width Across Corners	G' Number Of Corners			
ACA-08RL-MS10F	9/16-24UNEF-2B	φ4.0 to φ8.0 (φ0.16 to 0.32)	6 (0.24)	10.0 (0.39)	20 (0.79)	22.0 (0.87)	6	20 (0.79)	22.0 (0.87)	6	35 (1.38)	37 (1.46)	32 (1.26)
ACA-08RL-MS14F	3/4-20UNEF-2B	φ4.0 to φ8.0 (φ0.16 to 0.32)	7 (0.28)	13.8 (0.54)	20 (0.79)	22.0 (0.87)	6	23 (0.91)	25.3 (1.00)	6	36 (1.42)	37 (1.46)	32 (1.26)
ACA-12RL-MS10F	9/16-24UNEF-2B	φ8.0 to φ12.0 (φ0.32 to 0.47)	6 (0.24)	10.0 (0.39)	24 (0.94)	26.4 (1.04)	6	20 (0.79)	22.0 (0.87)	6	40 (1.57)	43 (1.69)	38 (1.50)
ACA-12RL-MS14F	3/4-20UNEF-2B	φ8.0 to φ12.0 (0.32 to 0.47)	7 (0.28)	13.8 (0.54)	24 (0.94)	26.4 (1.04)	6	23 (0.91)	25.3 (1.00)	6	41 (1.61)	43 (1.69)	38 (1.50)

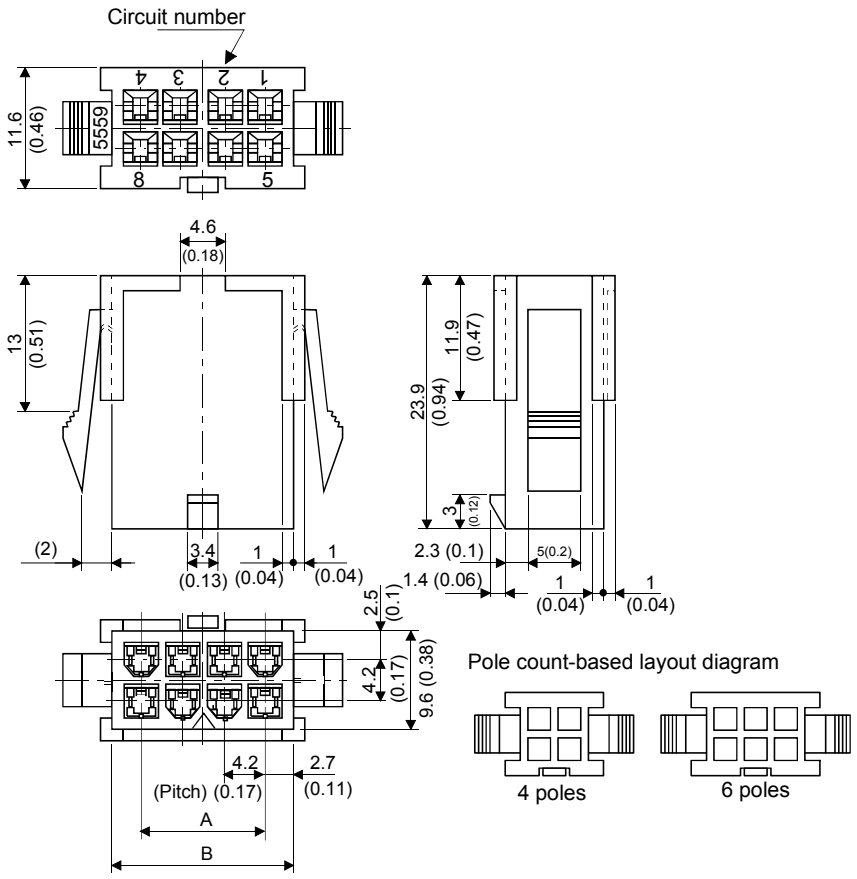
Note: (1) indicates the reference dimension before assembling, and (2) the reference dimension after assembling.

(3) Plug

[Unit: mm]
([Unit: in])

Model	Number of Poles	A	B
5509-04P-210	4 (0.16)	4.2 (0.17)	9.6 (0.38)
5559-06P-210	6 (0.24)	8.4 (0.33)	13.8 (0.54)

Terminal : 5558PBT3L
Hand tool : 57022-5300

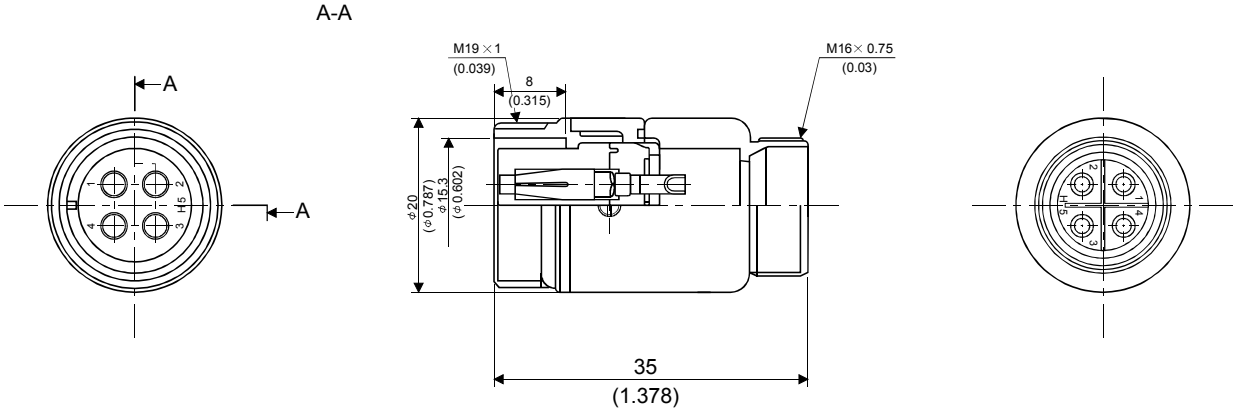


(4) Plug (For HC-UF□-S1)

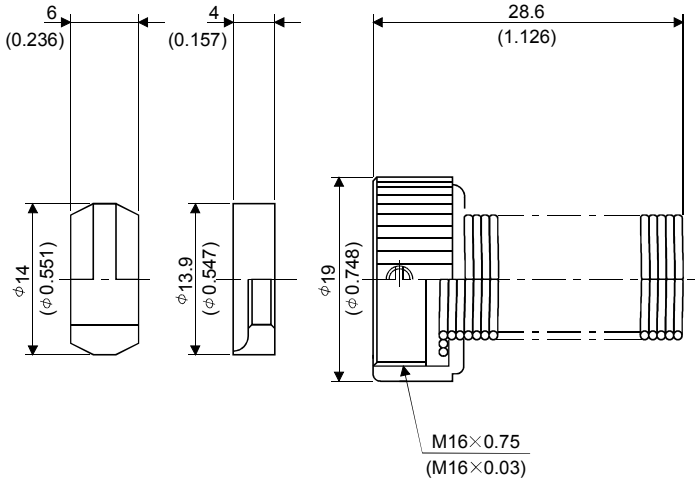
<Hirose Electric>

[Unit: mm]
([Unit: in])

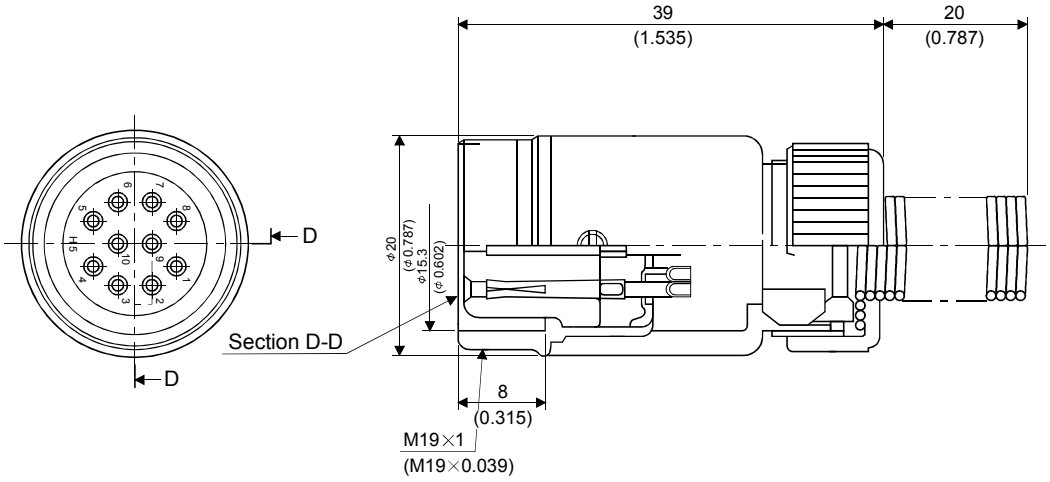
RM15WTJA-4S



RM15WTP-CP(8)



RM15WTJA-10S-(7)



Note: The numeral within the parentheses of the connector type indicates the applicable cable diameter, and the above diagrams show examples. The numeral depends on the used cable diameter.

MEMO

8. CALCULATION METHODS FOR DESIGNING

8.1 Specification symbol list

The following symbols are required for selecting the proper servo:

T_a	: Acceleration torque [N・m]		g	: Gravitational acceleration (9.8[m/s^2])	
T_d	: Deceleration torque [N・m]		μ	: Friction coefficient	
T_{Ma}	: Servo motor torque necessary for acceleration	[N・m]	π	: Circle ratio (3.14)	
			P_t	: Number of feedback pulses in position control mode	[pulse/rev]
T_{Md}	: Servo motor torque necessary for deceleration	[N・m]	f	: Input pulse frequency in position control mode	[pps]
T_{LH}	: Torque applied during servo motor stop	[N・m]	f_0	: Input pulse frequency during fast feed in position control mode	[pps]
T_L	: Load torque converted into equivalent value on servo motor shaft	[N・m]	t_{psa}	: Acceleration time constant of pulse frequency command in position control mode	[s]
T_U	: Unbalance torque	[N・m]	t_{psd}	: Deceleration time constant of pulse frequency command in position control mode	[s]
T_F	: Load friction torque	[N・m]	K_p	: Position control gain 1	[rad/s]
T_{L0}	: Load torque on load shaft	[N・m]	T_p	: Position control time constant (Tp=1/Kp)	[s]
T_{rms}	: Continuous effective load torque converted into equivalent value on servo motor shaft	[N・m]	$\Delta\ell$	: Feed per feedback pulse in position control mode	[mm/pulse]
J_L	: Load inertia moment converted into equivalent value on servo motor shaft	[kg・cm^2]	$\Delta\ell_0$	: Feed per command pulse in position control mode	[mm/pulse]
J_{L0}	: Load inertia moment on load shaft	[kg・cm^2]	ℓ	: Feed	[mm]
J_M	: Servo motor's rotor inertia moment	[kg・cm^2]	P	: Number of internal command pulses	[pulse]
N	: Servo motor speed	[r/min]	t_s	: Internal settling time	[s]
N_0	: Servo motor speed during fast feed	[r/min]	t_0	: Positioning time	[s]
N_{L0}	: Load shaft speed during fast feed	[r/min]	t_c	: Time at constant speed of servo motor in 1 cycle	[s]
V	: Moving part speed	[mm/min]	$t\ell$	: Stopping time in 1 cycle	[s]
V_0	: Moving part speed during fast feed	[mm/min]	$\Delta\varepsilon$	: Positioning accuracy	[mm]
P_b	: Ball screw lead	[mm]	ε	: Number of droop pulses	[pulse]
Z_1	: Number of gear teeth on servo motor shaft		ΔS	: Feed per servo motor revolution	[mm/rev]
Z_2	: Number of gear teeth on load gear		W	: Mass	[kg]
n	: Gear ratio $n=\frac{Z_2}{Z_1}$ Speed reduced when n>1, Speed increased when n<1				
η	: Drive system efficiency				

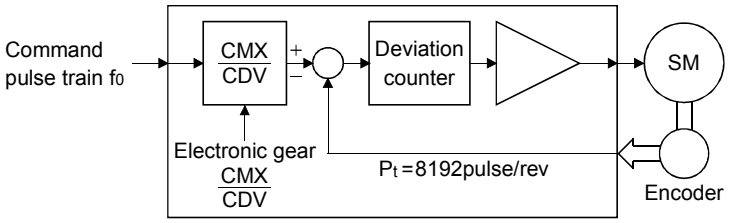
8.2 Position resolution and electronic gear setting

Position resolution (travel per pulse $\Delta\ell$) is determined by travel per servo motor revolution ΔS and the number of encoder feedback pulses Pt, and is represented by Equation 8.1. As the number of feedback pulses depends on the servo motor series, refer to Section 5.1.

$$\Delta\ell = \frac{\Delta S}{P_t} \quad \cdots\cdots (8.1)$$

$\Delta\ell$: Travel per pulse [mm]
ΔS : Travel per servo motor revolution [mm/rev]
P_t : Number of feedback pulses [pulse/rev]

Since $\Delta\ell$ has the relationship represented by Equation 8.1, its value is fixed in the control system after the drive system and encoder have been determined. However, travel per command pulse can be set as desired using the parameters.



As shown above, command pulses are multiplied by CMX/CDV set in the parameters to be position control pulses. Travel per command pulse $\Delta\ell$ is expressed by Equation 8.2:

$$\Delta\ell_0 = \frac{P_t}{\Delta S} \cdot \frac{CMX}{CDV} = \Delta\ell \cdot \frac{CMX}{CDV} \quad \cdots\cdots (8.2)$$

CMX: Electronic gear (Command pulse multiplication numerator)
CDV: Electronic gear (Command pulse multiplication denominator)

Using the above relationship, travel per command pulse can be set to a value without fraction.

[Setting example]
Find a parameter value for $\Delta\ell_0$ = 0.01 [mm] in a drive system where ball screw lead PB = 10 [mm] and reduction ratio 1/n = 1.
The encoder feedback pulses Pt of the HC—MF = 8192 [pulses/rev].
Since Δs = 10 [mm/rev], the following is obtained according to Equation 8.2:

$$\frac{CMX}{CDV} = \Delta\ell_0 \cdot \frac{P_t}{\Delta S} = 0.01 \cdot \frac{8192}{10} = \frac{1024}{125}$$

<Relationship between position resolution $\Delta\ell$ and overall accuracy>
Positioning accuracy of machine is the sum of electrical errors and mechanical errors. Normally, provisions should be made so that positioning accuracy are not affected by electrical system errors. As a guideline, Equation 8.3 should be satisfied:

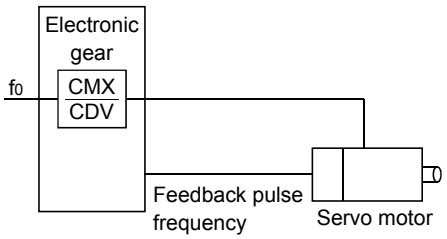
$$\Delta\ell < \left[\frac{1}{5} \text{ to } \frac{1}{10}\right] \cdot D\varepsilon \quad \cdots\cdots (8.3)$$

where, $\Delta\ell$: Travel per feedback pulse [mm/pulse]
$\Delta\varepsilon$: Positioning accuracy [mm]

8.3 Speed and command pulse frequency

The servo motor is run at a speed where the command pulses and feedback pulses are equivalent. Therefore, the command pulse frequency and feedback pulse frequency are equivalent. The relation including the parameter settings (CMX, CDV) is as indicated below (refer to the following diagram):

$$f_0 \cdot \frac{CMX}{CDV} = P_t \cdot \frac{N_0}{60} \quad \text{.....(8.4)}$$



f_0 :Command pulse frequency [pps]
CMX :Electronic gear
(Commanded pulse multiplication numerator)
CDV :Electronic gear
(Commanded pulse multiplication denominator)
N_0 :Servo motor speed [r/min]
P_t :Number of feedback pulses [pulses/rev]
(P_t = 8192 for HC-MF)

According to Equation 8.4, the following equations may be used to obtain the electronic gear and command pulse frequency to rotate the servo motor at No.

・Electronic gear

$$\frac{CMX}{CDV} = P_t \cdot \frac{N_0}{60} \cdot \frac{1}{f_0} \quad \text{.....(8.5)}$$

・Command pulse frequency

$$f_0 = P_t \cdot \frac{N_0}{60} \cdot \frac{CDV}{CMX} \quad \text{.....(8.6)}$$

[Setting example]
Obtain the command pulse frequency required to run the HC-MF at 3000r/min.
When the electronic gear ratio 1 (initial parameter value) is used, the following result is found according to Equation 8.6:

$$f_0 = 8192 \cdot \frac{N_0}{60} \cdot \frac{CDV}{CMX}$$

(Command pulse frequency)

$$= 8192 \cdot \frac{3000}{60} \cdot 1$$

$$= 409600[pps]$$

However, as the maximum input command pulse frequency in the open collector system is 200kpps, for general-purpose servo 409600pps cannot be entered.
To run the servo motor at the speed of 3000r/min at not more than 200kpps, the electronic gear setting must be changed. This electronic gear is found by Equation 8.5:

$$\frac{CMX}{CDV} = 8192 \cdot \frac{3000}{60} \cdot \frac{1}{200 \cdot 10^3}$$

(Electronic gear)

$$= \frac{256}{125}$$

Therefore, the parameters are set to CMX=256 and CDV = 125.

8.4 Stopping characteristics

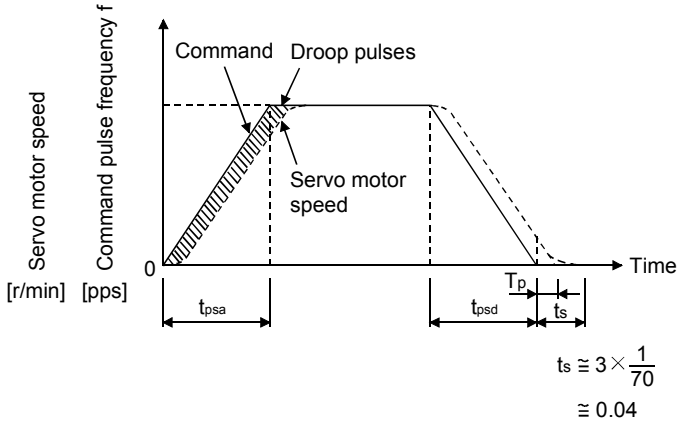
(1) Droop pulses (ε)

When a pulse train command is used to run the servo motor, there is a relationship between the command pulse frequency and servo motor speed as shown in the figure. The difference between the command pulses and feedback pulses during acceleration are called droop pulses, which are accumulated in the servo amplifier's deviation counter. Equation 8.7 defines a relationship between the command pulse frequency (f) and position control gain 1(Kp).

$$\varepsilon \cong \frac{f_0}{Kp}[\text{pulse}] \quad \text{.....(8.7)}$$

Supposing that the value of position control gain 1 is 70 [rad/s], the droop pulses during operation will be as follows at the command pulse frequency of 200 [kpps] according to Equation 15.1:

$$\varepsilon \cong \frac{200 \cdot 10^3}{1} \cong 2858[\text{pulse}]$$



(2) Settling time (ts) during linear acceleration/deceleration

Since droop pulses still exist when there are no command pulses, settling time (ts) is required until the servo motor stops. Set the operation pattern in consideration for the settling time.
The settling time (ts) value is obtained according to Equation 8.8:

$$ts \cong 3 \cdot Tp$$

$$= 3 \cdot \frac{1}{Kp}[\text{s}] \quad \text{.....(8.8)}$$

*When Kp = 70 [rad/s], ts ≅ 0.04 [s]. (Refer to the above diagram.)

The settling time (ts) indicates the time required for the servo motor to stop in the necessary positioning accuracy range. This does not always mean that the servo motor has stopped completely. Thus, especially when the servo motor is used in high-duty operation and positioning accuracy has no margin for travel per pulse ($\Delta\ell$), the value obtained by Equation 8.8 must be increased.
The settling time (ts) will vary with the moving part conditions. Especially when the load friction torque is large, movement may be unstable near the stopping position.

8.5 Capacity selection

As a first step, confirm the load conditions and temporarily select the servo motor capacity. Then, determine the operation pattern, calculate required torques according to the following equations, and check that the servo motor of the initially selected capacity may be used for operation .

(1) Initial selection of servo motor capacity

After calculating the load torque (T_L) and load inertia moment (J_L), select a servo motor which will satisfy the following two relationships:

Servo motor's rated torque > T_L

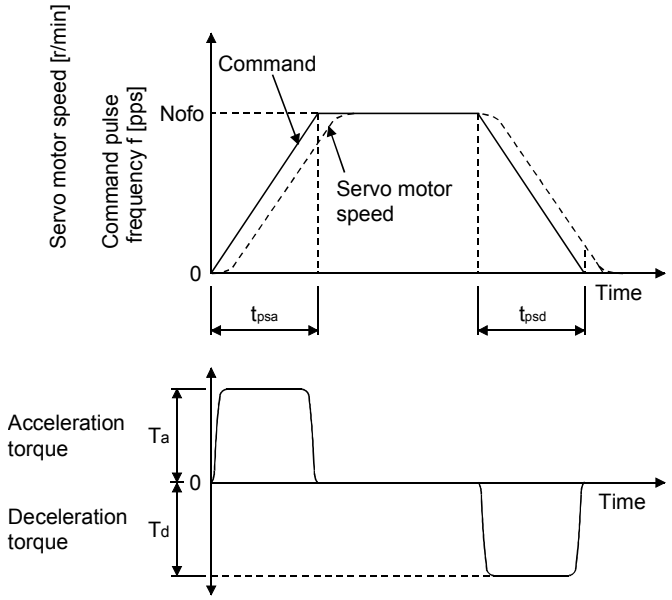
Servo motor J_M > J_L/m

m = 3	: High duty (more than 100 times/min.) Settling time 40ms or less
m = 5	: Middle duty (60 to 100 times/min.) Settling time 100ms or less
m = permissible load inertia moment	: Low duty (less than 60 times/min.) Settling time more than 100ms

Find the acceleration and deceleration torques and continuous effective load torque as described in (2) to make a final selection. For high-duty positioning, the load inertia moment (J_L) value should be as small as possible. If positioning is infrequent as in line control, the load inertia moment (J_L) value may be slightly larger than in the above conditions.

(2) Acceleration and deceleration torques

The following equations are used to calculate the acceleration and deceleration torques in the following operation pattern:

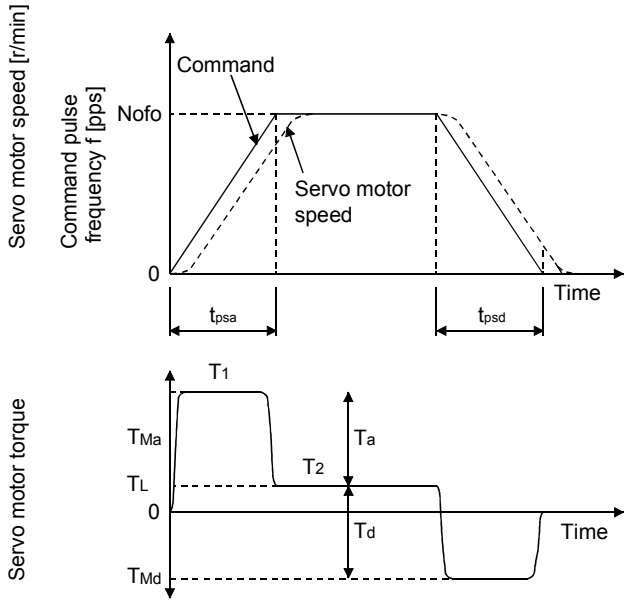


・ Acceleration torque $T_a = \dfrac{(J_L+J_M)\cdot No}{9.55\cdot 10^4}\cdot\dfrac{1}{t_{psa}}$ .....(8.9)

・ Deceleration torque $T_d = \dfrac{(J_L+J_M)\cdot No}{9.55\cdot 10^4}\cdot\dfrac{1}{t_{psd}}$ .....(8.10)

(3) Torques required for operation

Torques required for the servo motor are the highest during acceleration. If any of the torques obtained with Equations 8.11 to 8.13 exceeds the maximum servo motor torque, the servo motor speed cannot be increased as commanded. Confirm that the calculated value is lower than the servo motor's maximum torque. Since a friction load is normally applied during deceleration, only the acceleration torque needs to be considered. In the regenerative mode, the value found by Equation 8.13 is negative.



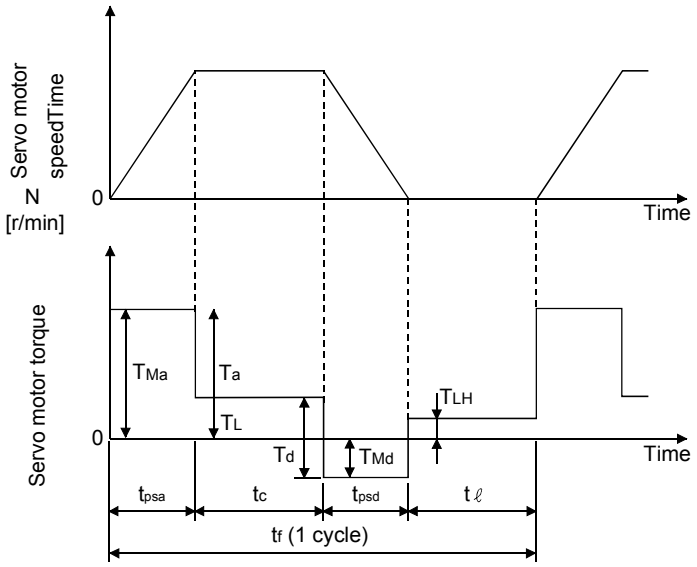
$T_1 = T_{Ma} = Ta + T_L$ ..... (8.11)

$T_2 = T_L$ ..... (8.12)

$T_3 = T_{Md} = -Td + T_L$ ..... (8.13)

(4) Continuous effective load torque

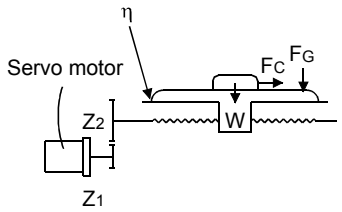
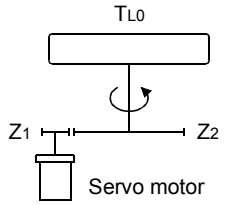
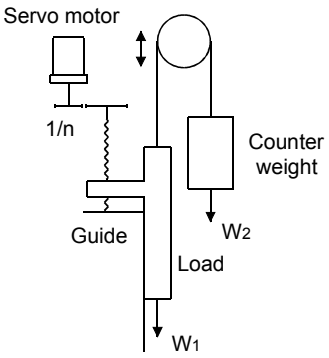
If the torque required for the servo motor changes with time, the continuous effective load torque should be lower than the rated torque of the servo motor. There may be a servo motor torque delay at the start of acceleration or deceleration due to a delay in the control system. To simplify the calculation, however, it is assumed that constant acceleration and deceleration torques are applied during t_{psa} and t_{psd}. The following equation is used to calculate the continuous effective load torque in the following operation pattern. TLH indicates the torque applied during a servo motor stop. A large torque may be applied especially during a stop in vertical motion applications, and this must be fully taken into consideration. During vertical drive, the unbalanced torque TU will become TLH.



$$Trms = \sqrt{\frac{T^2_{Ma} \cdot t_{psa} + T^2_{L} \cdot tc + T^2_{Md} \cdot t_{psd} + T^2_{LH} \cdot t\ell}{tf}} \quad \text{.....(8.14)}$$

8.6 Load torque equations

Typical load torque equations are indicated below:

Type	Mechanism	Equation
Linear movement		$T_L = \frac{F}{2 \cdot 10^3 \cdot \pi \cdot \eta} \cdot \frac{V}{N} = \frac{F \cdot \Delta S}{2 \cdot 10^3 \cdot \pi \cdot \eta}$ ..... (8.15) F : Force in the axial direction of the machine in linear motion [N] F in Equation 15.9 is obtained with Equation 8.16 when the table is moved, for example, as shown in the left diagram. $F = Fc + \mu \cdot (W \cdot g + F_G)$ ..... (8.16) Fc : Force applied in the axial direction of the moving part [N] F_G : Tightening force of the table guide surface [N] W : Full mass of the moving part [kg]
Rotary movement		$T_L + \frac{1}{n} \cdot \frac{1}{\eta} \cdot T_{L0} + T_F$ ..... (8.17) T_F : Load friction torque converted into equivalent value on servo motor shaft [N · m]
Vertical movement		During rise $T_L = T_U + T_F$ ..... (8.18) During fall $T_L = -T_U \cdot \eta^2 + T_F$ ..... (8.19) T_F: Friction torque of the moving part [N · m] $T_U = \frac{(W_1 - W_2) \cdot g}{2 \cdot 10^3 \cdot \pi \cdot \eta} \cdot \frac{V}{N} = \frac{(W_1 - W_2) \cdot g \cdot \Delta S}{2 \cdot 10^3 \cdot \pi \cdot - \cdot \eta}$ ..... (8.20) $T_F = \frac{\mu (W_1 + W_2) \cdot g \cdot \Delta S}{2 \cdot 10^3 \cdot \pi \cdot \eta}$ ..... (8.21) W_1: Mass of load [kg] W_2: Mass of counterweight [kg]

8.7 Expression for calculating the electromagnetic brake workload

Calculate the brake workload Eb [J] at an emergency stop with the following expression.

$$Eb = \frac{(J_M + J_L) \cdot N^2}{182} \cdot 10^{-4}$$

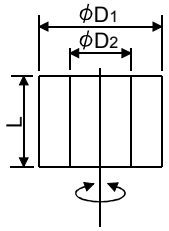
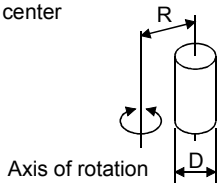
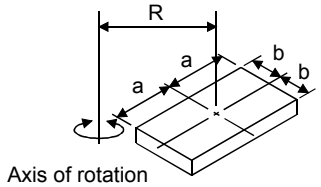
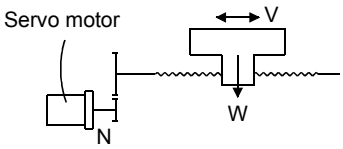
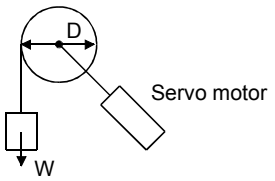
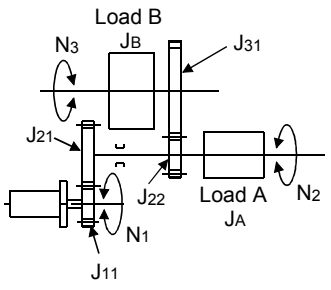
N: Servo motor speed [r/min]

J_M: Servo motor's rotor inertia moment [kg · cm^2]

J_L: Load inertia moment converted into equivalent value on servo motor shaft [kg · cm^2]

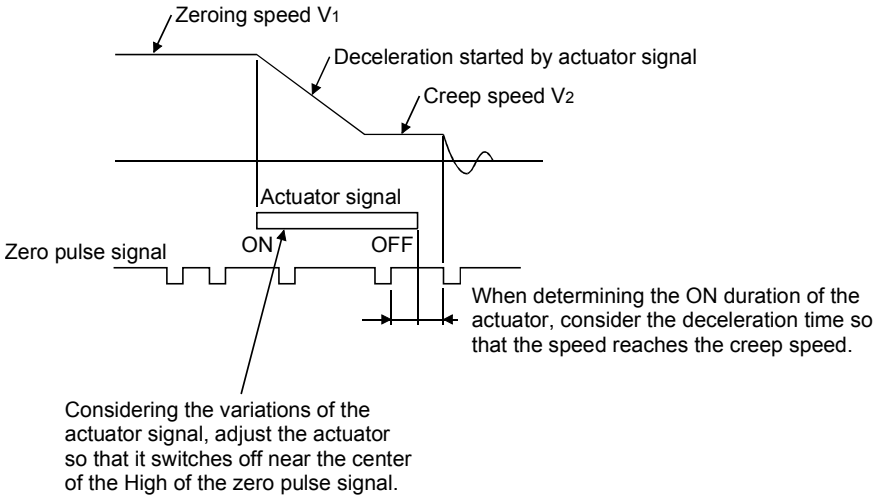
8.8 Load inertia moment equations

Typical load inertia moment equations are indicated below:

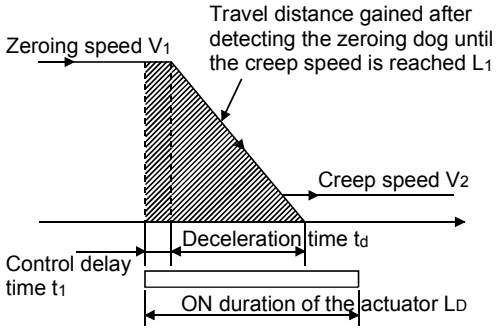
Type	Mechanism	Equation
Cylinder	Axis of rotation is on the cylinder center 	$J_{L0}=\frac{\pi\cdot\rho\cdot L}{32}\cdot(D_1^4-D_2^4)=\frac{W}{8}\cdot(D_1^2+D_2^2)$ .....(8.22) ρ : Cylinder material density [kg/cm³] L : Cylinder length [cm] D1 : Cylinder outside diameter [cm] D2 : Cylinder inside diameter [cm] W : Cylinder mass [kg] Reference data: material density Iron : $7.8\cdot10^{-3}$ [kg/cm³] Aluminum : $2.7\cdot10^{-3}$ [kg/cm³] Copper : $8.96\cdot10^{-3}$ [kg/cm³]
	Axis of rotation is off the cylinder center 	$J_{L0}=\frac{W}{8}\cdot(D^2+8R^2)$ .....(8.23)
Square block		$J_{L0}=W\cdot\left(\frac{a^2+b^2}{3}+R^2\right)$ .....(8.24) W : Square block mass [kg] a, b, R : Left diagram [cm]
Object which moves linearly		$J_L=W\cdot\frac{V}{600\cdot\omega}=W\cdot\left(\frac{1}{2\cdot\pi\cdot N}\cdot\frac{V}{10}\right)^2=W\cdot\left(\frac{\Delta S}{20\cdot\pi}\right)^2$ .....(8.25) V : Speed of object moving linearly [mm/min] ΔS : Moving distance of object moving linearly per servo motor revolution [mm/rev] W : Object mass [kg]
Object that is hung with pulley		$J_L=W\cdot\left(\frac{D}{2}\right)^2+Jp$ .....(8.26) JP : Pulley inertia moment [kg · cm²] D : Pulley diameter [cm] W : Object mass [kg]
Converted load		$J_L=J_{11}+(J_{21}+J_{22}+J_A)\cdot\left(\frac{N_2}{N_1}\right)^2+(J_{31}+J_B)\cdot\left(\frac{N_3}{N_1}\right)^2$ .....(8.27) JA, JB : Inertia moments of loads A, B [kg · cm²] J11 to J31 : Inertia moments [kg · cm²] N1 to N3 : Speed of each shaft [r/min]

8.9 Precautions for zeroing

When a general positioning unit is used, the sequence of events is as shown in the following figure.



(1) When determining the ON duration of the actuator, consider the delay time of the control section and the deceleration time so that the creep speed is attained. If the actuator signal switches off during deceleration, precise home position return cannot be performed.



Travel distance L1 in the chart can be obtained by Equation 8.28

$$L_1 = \frac{1}{60} \cdot V_1 \cdot t_1 + \frac{1}{120} \cdot V_1 \cdot t_d \cdot \left\{ 1 - \left(\frac{V_2}{V_1} \right)^2 \right\} + \frac{1}{60} \cdot V_1 \cdot T_p \quad \text{..... (8.28)}$$

ON duration of the actuator LD [mm] must be longer than L1 obtained by Equation 8.28, as indicated in Equation 8.29

$L_D > L_1$ ..... (8.29)

where,

V_1, V_2 : As shown in the chart [mm/min]

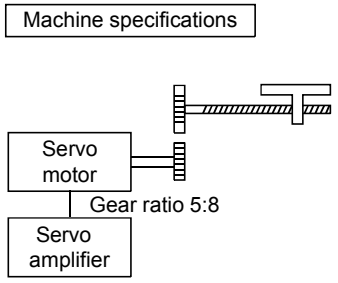
t_1, t_d : As shown in the chart [s]

L_1 : As shown in the chart [mm]

L_D : As shown in the chart [mm]

(2) Set the end (OFF position) of the actuator signal at the middle of two ON positions (Lows) of the zero pulse signal. If it is set near either ON position of the zero pulse signal, the positioning unit is liable to misdetect the zero pulse signal. In this case, a fault will occur, e.g. the home position will shift by one revolution of the servo motor.
The zero pulse output position can be confirmed by OP (encoder Z-phase pulse) on the external I/O signal display.

8.10 Selection example



Speed of moving part during fast feed	V_0	= 30000[mm/min]
Command resolution	$\Delta\ell$	= 10[μm]
Travel	ℓ	= 400[mm]
Positioning time	t_0	= within 1[s]
Number of feeds		40[times/min]
Operation cycle	tf	= 1.5[s]
Gear ratio	n	= 8/5
Moving part mass	W	= 60[kg]
Drive system efficiency	η	= 0.8
Friction coefficient	μ	= 0.2
Ball screw lead	Pb	= 16[mm]
Ball screw diameter		20[mm]
Ball screw length		500[mm]
Gear diameter (servo motor)		25[mm]
Gear diameter (load shaft)		40[mm]
Gear face width		10[mm]

(1) Selection of control parameters

Setting of electronic gear (command pulse multiplication numerator, denominator)
There is the following relationship between the multiplication setting and travel per pulse $\Delta\ell$.

$$\Delta\ell = \frac{\text{(ball screw lead)}}{8192 \cdot \text{(gear ration)}} \cdot \left(\frac{CMX}{CDV}\right)$$

When the above machining specifications are substituted in the above equation:

$$\frac{CMX}{CDV} = 10 \cdot \frac{8192 \cdot 8/5}{16 \cdot 1000} = \frac{8192}{1000}$$

Acceptable as CMX/CDV is within 1/20 to 20.

(2) Servo motor speed

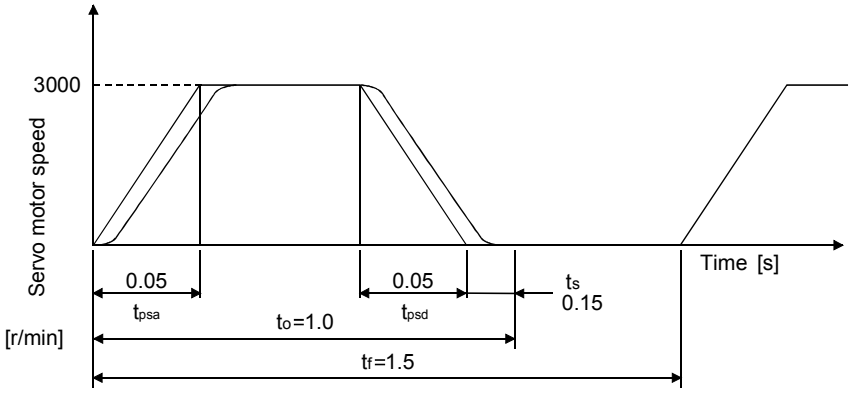
$$No = \frac{V_0}{Pb} \cdot n = \frac{30000}{16} \cdot \frac{8}{5} = 3000[r/min]$$

(3) Acceleration/deceleration time constant

$$t_{psa} = t_{psd} = t_0 - \frac{\ell}{V_0/60} - ts = 0.05[s]$$

ts: settling time.(Here, this is assumed to be 0.15s.)

(4) Operation pattern



(5) Load torque (converted into equivalent value on servo motor shaft)

Travel per servo motor revolution

$$\Delta S = Pb \cdot \frac{1}{n} = 16 \cdot \frac{5}{8} = 10[mm]$$

$$T_L = \frac{\mu \cdot W \cdot g \cdot \Delta S}{2 \cdot 10^3 \cdot \pi \cdot \eta} = \frac{0.2 \cdot 60 \cdot 9.8 \cdot 10}{2 \cdot 10^3 \cdot 3.14 \cdot 0.8} = 0.23[N \cdot m]$$

(6) Load inertia moment (converted into equivalent value on servo motor shaft)

Moving part

$$J_{L1} = W \cdot \left(\frac{\Delta S}{20\pi}\right)^2 = 1.52[kg \cdot cm^2]$$

Ball screw

$$J_{L2} = \frac{\pi \cdot \rho \cdot L}{32} \cdot D^4 \cdot \left(\frac{1}{n}\right)^2 = 0.24[kg \cdot cm^2]$$

$$*\rho = 7.8 \cdot 10^{-3}[kg \cdot cm^3]$$

Gear (servo motor shaft)

$$J_{L3} = \frac{\pi \cdot \rho \cdot L}{32} \cdot D^4 = 0.03[kg \cdot cm^2]$$

Gear (load shaft)

$$J_{L4} = \frac{\pi \cdot \rho \cdot L}{32} \cdot D^4 \cdot \left(\frac{1}{n}\right)^2 = 0.8[kg \cdot cm^2]$$

Full load inertia moment (converted into equivalent value on servo motor shaft)

$$J_L = J_{L1} + J_{L2} + J_{L3} + J_{L4} = 2.59[kg \cdot cm^2]$$

(7) Temporary selection of servo motor

Selection conditions

(a) Load torque < servo motor's rated torque

(b) Full load inertia moment < 30 · servo motor inertia moment

From the above, the HC-MF23 (200W) is temporarily selected.

(8) Acceleration and deceleration torques

Torque required for servo motor during acceleration

$$T_{Ma} = \frac{(J_L + J_M) \cdot N_O}{9.55 \cdot 10^4 \cdot T_{psa}} + T_L = 1.7[N \cdot m]$$

Torque required for servo motor during deceleration

$$T_{Md} = \frac{(J_L + J_M) \cdot N_O}{9.55 \cdot 10^4 \cdot T_{psd}} + T_L = -1.2[N \cdot m]$$

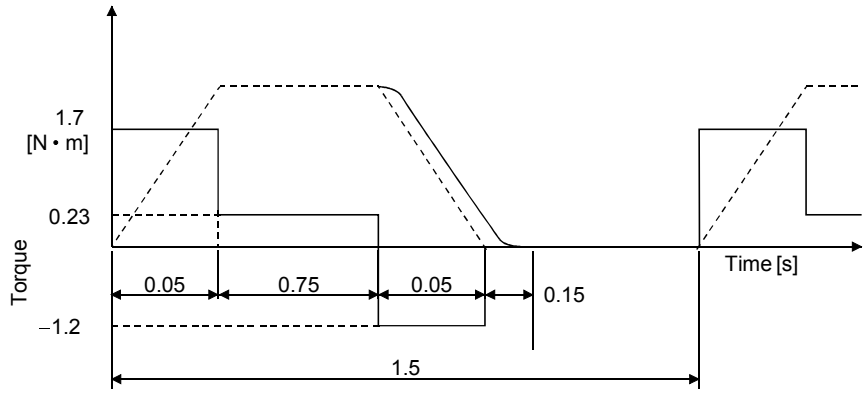
The torque required for the servo motor during deceleration must be lower than the servo motor's maximum torque.

(9) Continuous effective load torque

$$Trms = \sqrt{\frac{T_{Ma}^2 \cdot t_{psa} + T_L^2 \cdot tc + T_{Md}^2 \cdot t_{psd}}{tf}} = 0.42[N \cdot m]$$

The continuous effective load torque must be lower than the servo motor's rated torque.

(10) Torque pattern



(11) Selection results

The HC-MF23 servo motor and MR-J2-20A servo amplifier are selected.

(a) Electronic gear setting

CMX = 8192

CDV = 1000

(b) During rapid feed

Servo motor speed N_0 = 3000 [r/min]

(c) Acceleration/deceleration time constant

$t_{psa} = t_{psd}$ = 0.05[s]

App. 1 Servo motor ID codes

Motor series ID	Motor type ID	Encoder ID	Servo motor
02	F053	003D	HC-MF053
	FF13		HC-MF13
	FF23		HC-MF23
	FF43		HC-MF43
	FF73		HC-MF73
11	F053		HA-FF053
	FF13		HA-FF13
	FF23		HA-FF23
	FF33		HA-FF33
	FF43		HA-FF43
	FF63		HA-FF63
12	F053		HC-KF053
	FF13		HC-KF13
	FF23		HC-KF23
	FF43		HC-KF43
	FF73		HC-KF73
21	FF81	003C	HC-SF81
	F121		HC-SF121
	F201		HC-SF201
	F301		HC-SF301
	FF52		HC-SF52
	F102		HC-SF102
	F152		HC-SF152
	F202		HC-SF202
	F352		HC-SF352
	F502		HC-SF502
	F702		HC-SF702
	FF53		HC-SF53
	F103		HC-SF103
	F153		HC-SF153
22	F203		HC-SF203
	F353		HC-SF353
31	FF13		HC-UF13
	FF23		HC-UF23
	FF43		HC-UF43
	FF73		HC-UF73
	FF32		HC-UF32
	FF72		HC-UF72
	F152		HC-UF152
	F202		HC-UF202
41	F103	003C	HC-RF103
	F153		HC-RF153
	F203		HC-RF203
02	F053	0041	HC-MFS053
	FF13		HC-MFS13
	FF23		HC-MFS23
	FF43		HC-MFS43
	FF73		HC-MFS73
12	F053		HC-KFS053
	FF13		HC-KFS13
	FF23		HC-KFS23
	FF43		HC-KFS43
	FF73		HC-KFS73

Motor series ID	Motor type ID	Encoder ID	Servo motor
21	FF81	0041	HC-SFS81
	F121		HC-SFS121
	F201		HC-SFS201
	F301		HC-SFS301
	FF52		HC-SFS52
	F102		HC-SFS102
	F152		HC-SFS152
	F202		HC-SFS202
	F352		HC-SFS352
	F502		HC-SFS502
	F702		HC-SFS702
	FF53		HC-SFS53
	F103		HC-SFS103
	F153		HC-SFS153
22	F203		HC-SFS203
	F353		HC-SFS353
24	FF52		HC-SFS524
	F102		HC-SFS1024
	F152		HC-SFS1524
	F202		HC-SFS2024
	F352		HC-SFS3524
	F502		HC-SFS5024
	F702		HC-SFS7024
31	FF13		HC-UFS13
	FF23		HC-UFS23
	FF43		HC-UFS43
	FF72		HC-UFS72
	FF73		HC-UFS73
	F152		HC-UFS152
	F202		HC-UFS202
	F352		HC-UFS352
	F502		HC-UFS502
41	F103		HC-RFS103
	F153		HC-RFS153
	F203		HC-RFS203
	F353		HC-RFS353
	F503		HC-RFS503
51	FF52		HC-LFS52
	F102		HC-LFS102
	F152		HC-LFS152
	F202		HC-LFS202
	F302		HC-LFS302
53	F601		HA-LFS601
	F801		HA-LFS801
	1201		HA-LFS12K1
	1501		HA-LFS15K1
	2001		HA-LFS20K1
	2501		HA-LFS25K1
	3001		HA-LFS30K1
	3701		HA-LFS37K1
	F502		HA-LFS502
	F702		HA-LFS702
	1102		HA-LFS11K2
	1502		HA-LFS15K2
	2202		HA-LFS22K2
	3002		HA-LFS30K2
	3702		HA-LFS37K2

Motor series ID	Motor type ID	Encoder ID	Servo motor
54	F601	0041	HA-LFS6014
	F801		HA-LFS8014
	1201		HA-LFS12K14
	1501		HA-LFS15K14
	2001		HA-LFS20K14
	1102		HA-LFS11K24
	1502		HA-LFS15K24
	2202		HA-LFS22K24
	2501		HA-LFS25K14
	3001		HA-LFS30K14
	3701		HA-LFS37K14
	3002		HA-LFS30K24
	3702		HA-LFS37K24
	4502		HA-LFS45K24
	5502		HA-LFS55K24
55	F701		HA-LFS701M
	1101		HA-LFS11K1M
	1501		HA-LFS15K1M
	2201		HA-LFS22K1M
	3001		HA-LFS30K1M
	3701		HA-LFS37K1M
56	F701		HA-LFS701M4
	1101		HA-LFS11K1M4
	1501		HA-LFS15K1M4
	2201		HA-LFS22K1M4
	3001		HA-LFS30K1M4
	3701		HA-LFS37K1M4
	4501		HA-LFS45K1M4
57	5001		HA-LFS50K1M4

App. 2 Change of connector sets to the RoHS compatible products

The following connector sets have been changed to RoHS compliant since September 2006.
RoHS compliant and non-RoHS compliant connector sets may be mixed based on availability.
Only the components of the connector set that have changed are listed below.

Model	Current Product	RoHS Compatible Product
MR-ENCNS	Amplifier connector (3M or equivalent) 10120-3000VE (connector) MS3106A20-29S (D190) (Plug, DDK) CE3057-12A-3 (D265) (Cable clump, DDK) CE02-20BS-S (Back shell, DDK)	Amplifier connector (3M or equivalent) 10120-3000PE (connector) D/MS3106A20-29S (D190) (Plug, DDK) CE3057-12A-3-D (Cable clump, DDK) CE02-20BS-S-D (Back shell, DDK)
MR-PWCNS1	Power supply connector (DDK) CE05-6A22-23SD-B-BSS (Connector and back shell) CE3057-12A-2 (D265) (Cable clump)	Power supply connector (DDK) CE05-6A22-23SD-D-BSS (Connector and back shell) CE3057-12A-2-D (Cable clump)
MR-PWCNS2	Power supply connector (DDK) CE05-6A24-24SD-B-BSS (Connector and back shell) CE3057-16A-2 (D265) (Cable clump)	Power supply connector (DDK) CE05-6A24-10SD-B-BSS (Connector and back shell) CE3057-16A-2-D (Cable clump)
MR-PWCNS3	Power supply connector (DDK) CE05-6A32-17SD-B-BSS (Connector and back shell) CE3057-20A-1 (D265) (Cable clump)	Power supply connector (DDK) CE05-6A32-17SD-D-BSS (Connector and back shell) CE3057-20A-1-D (Cable clump)
MR-BKCN	Electromagnetic brake connector MS3106A10SL-4S (D190) (Plug, DDK)	Electromagnetic brake connector D/MS3106A10SL-4S (D190) (Plug, DDK)

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Data	*Manual Number	Revision
May.,1998	SH(NA)3181-A	First edition
Sep.,1998	SH(NA)3181-B	HA-LH11K2 to 22K2 added HC-SF502(B), 702(B) added HC-RF353(B), 503(B) added HC-UF352(B), 502(B)/HC-UF73(B) added UL/C-UL Standard: Flange size list modified Section 1.3: Terminal box type added Chapter 3: Overall changes Section 5.1: Applicable servo amplifier and regenerative brake duty added for MR-H□-N Power supply capacity deleted Section 5.3: HC-MF's permissible speed changed Section 7.1.1 (2), (c), 2): HA-FF053BG1 1/5 inertia moment changed Section 7.3: Reviewed due to overall changes to Chapter 3
Feb.,1999	SH(NA)3181-C	HC-KF23(B), 43(B) added HC-AQ0135(B) to 0335(B) added HA-LF30K24 to 55K24 added HC-UF-S1 added UL/C-UL Standard: Flange size list modified Section 1.1: Servo motor feature list modified Section 1.2, (2), (h): HC-KF, HC-AQ, HA-LF added to the models Section 2.1: HC-KF, HC-AQ, HA-LF added to the list Section 2.3: Sentence modified Section 2.5: HC-KF, HC-AQ, HA-LF added to the list Section 2.6: HC-KF, HC-AQ, HA-LF added Section 2.7: Addition Section 3.1.4: HC-AQ added Section 3.2: List modified Section 3.3: HC-AQ added Section 5.1: HC-KF, HC-AQ, HA-LF added Insulation class added Regenerative brake duty changed: HC-SF121, HC-SF301, HC-RF503,HC-UF72, HC-UF152, HC-UF23, HC-UF43, HC-UF73 Rated current, maximum current changed: HC-SF702 Section 5.2: HC-KF, HC-AQ, HA-LF added HC-UF73 modified Section 5.3: HC-KF added Section 6.1: HC-KF, HC-AQ added Section 7.1.1: HC-UF73 modified HC-UF73B, HC-UF-S1, HC-KF, HC-AQ, HA-LF added Section 7.1.2: HC-KF-UE added Section 7.2.1: HC-UF73 modified HC-UF73B, HC-UF-S1, HC-KF, HC-AQ, HA-LF added Section 7.2.2: HC-KF-UE added
Mar., 2000	SH(NA)3181-D	HC-KFS, HC-MFS, HC-SFS, HC-RFS, HC-UFS, HC-LF30K2 addition Section 1.1: Motor addition Section 1.2: Motor addition Section 2.1: Table modification Section 2.2: Motor addition Section 2.5: Motor addition Section 2.6: Sentence change, motor addition to table Sections 3.1.1 to 3.1.3: Reconsideration

Print Data	*Manual Number	Revision
Mar., 2000	SH(NA)3181-D	Section 3.1.5: Reconsideration Sections 3.2, 3.3: Motor addition Section 5.1: Note 12 change, motor addition Sections 5.2 to 5.4: Motor addition Section 7.1: Item reconsideration, motor addition HC-MF, HC-KF, HC-UF3000r/min outline drawing change Section 7.2 (3): Plug addition
Feb., 2001	SH(NA)3181-E	Addition of HC-KFS73, HC-SFS502・702, HC-RFS352・502 and HC-UFS502 COMPLIANCE WITH EC DIRECTIVES 2. (B): Addition of servo motors Section 1.1: Correction to error in writing of HA-LF Standard models of HC-KF and HC-MF are made compliant with overseas standards. Section 1.2: Addition of servo motors Section 2.1: Change of vibration conditions Section 2.4 (9): Addition of sentence Section 2.5 (3): Deletion of Note 2 Section 2.6 (2): Deletion of Note 2 Section 3.1.3: Addition of servo motors Section 3.2: Addition of servo motors Section 5.1: Addition of servo motor specifications Deletion of HC-SF52 and MR-RB32 combinations Deletion of HC-SF53 and MR-RB32 combinations Change of the number of regenerative frequencies of HC-UF72 (previously 102, 305, 508 from top to bottom) Change of HC-KF series and HA-LF series servo amplifier combinations HA-LF30K2's previous rated current 83A, maximum current 208A, cooling fan rated current 0.32 (50Hz)/63 (50Hz) Deletion of HC-SFS52 and MR-RB32 combinations Deletion of HC-SFS53 and MR-RB32 combinations Deletion of HC-UFS72 and MR-RB32 combinations Addition of Note 13 Section 5.2: Addition of torque characteristics Section 5.3 (1): Addition of servo motors Section 5.3 (2): Previous permissible load inertia moment HC-KF, HC-KFS: 25 times HC-MF, HC-MFS: 5 times Section 5.3 (4)(C) 1): Previously 2000 hours Section 5.3 (4)(C) 2): Previously 25000 hours at second time and later Section 5.4: Addition of servo motors Section 6.1 (1): HC-KF series 23B, 43B Previous permissible braking work done per braking 4500[N・Em] Previous permissible braking work done per braking 45000[N・Em] Section 7.1: Addition of servo motors
Oct., 2002	SH(NA)3181-F	Safety Instructions: Environmental condition table modification Addition of About processing of waste Addition of FOR MAXIMUM SAFETY Reexamination of table in COMPLIANCE WITH EC DIRECTIVES Addition of text to the UL/C-U Standards, addition of HA-LF, HA-LFS series Section 1.1: Addition of HA-FF, HA-LFS, HC-LFS, addition of Note sentences

Print Data	*Manual Number	Revision
Oct., 2002	SH(NA)3181-F	Section 1.2: Change/deletion of rating plate, addition of (o) HA-LFS series, addition of (p) HC-LFS series Section 1.2 (2) (i): Change of HA-LF series contents Section 1.3: Change of terminal box type motor diagram Chapter 2: Addition of CAUTION sentences, deletion of transportation item Section 2.1: Addition of HA-LFS, HC-LFS series Section 2.2: Addition of HA-LFS Section 2.3: Change of (6) into POINT Section 2.4: Addition of POINT, change of (3) text Addition of HC-KF, HC-KFS73, HA-LFS, HC-LFS Section 2.4.1: Addition Section 2.4.2: Addition Section 2.5: Addition of (6), (7), (8) Section 2.5 (1): Addition of HA-LFS, HC-LFS series Section 2.5 (2): Partial change of text, addition of HA-LFS, HC-LFS Section 2.5 (5): Partial change of text Section 2.6: Addition of HA-LFS Section 2.7: Change Section 3.1: Reexamination of table Section 3.1.3: Addition of HA-LFS, HC-LFS Section 3.1.6: Item addition Section 3.2: Addition of HA-LFS, HC-LFS series Section 3.3: Addition of HA-LFS, HC-LFS series Chapter 4: Addition of (d) Chapter 4 (2): Partial change of table Section 5.1: Reexamination of table Addition of HA-LF series 37K2 Addition of HC-MFS series, HC-KFS series compatible servo amplifiers Addition of HC-UFS series compatible servo amplifiers Addition of HA-LFS, HC-LFS series Reexamination of Note sentences Section 5.2: Partial deletion of POINT sentences, addition of items (10) to (13) Section 5.2 (1): Addition of POINT, reexamination of graph Section 5.2 (2): Addition of POINT, reexamination of graph Section 5.2 (5): Addition of POINT, reexamination of graph Section 5.2 (7): Change of HC-KF053 graph, reexamination of graph Section 5.3 (1): Addition of Note sentences Section 5.3 (2): Partial deletion of table Section 5.3 (4) (c): Change of title Section 5.4: Addition of HC-LFS series Section 5.4.1 (2): Addition of HC-LFS series Section 6.1: Addition of CAUTION sentences Section 6.1 (1): Addition of text, reexamination of table, addition of HC-LFS series Section 6.1 (2): Deletion of diagrams in (a), (b) Section 6.3: Addition Section 7.1: Addition of Note sentences, addition of text in With reduction gear Section 7.1.1 (3) (a): Change of BC12066, BC12067 outline drawings Section 7.1.1 (3) (b): Change of BC12071, BC12072 outline drawings Section 7.1.2 (4) (b): Partial change of HA-FF13BG2 inertia moment values Section 7.1.3 (3) (a): Partial reexamination of outline drawing sub numbers Section 7.1.3 (3) (b): Partial reexamination of outline drawing sub numbers Section 7.1.3 (4) (a): Partial reexamination of outline drawing sub numbers Section 7.1.3 (4) (b): Partial reexamination of outline drawing sub numbers

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Sep., 2003	SH(NA)3181-H	Safety Instructions: Partial change of text in 3 Addition of HC-SFS524, 1024, 1524, 2024 and 7024, and HA-LFS6014 and 701M4 to the environment condition table Addition of HC-SFS524, 1024, 1524, 2024 and 7024 to the table in (b) of COMPLIANCE WITH EC DIRECTIVES Addition of HC-SFS524, 1024, 1524, 2024 and 7024, and HA-LFS6014 and 701M4 and addition of Note to the UL/C-UL STANDARD Section 1.1: Change of the capacities supported by HC-SFS400V and partial change of the capacities supported by HA-LFS400V Section 1.2 (2) (l) 2): Rated output addition Section 1.2 (2) (o) 2): Rated output addition

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Oct., 2004	SH(NA)3181-J	Section 5.2 (3): Remarks addition Graph change to HC-SF(S)52, HC-SF(S)102, HC-SF(S)152, HC-SF(S)202, HC-SF(S)702 in (a) and HC-SFS524, HC-SFS1024, HC-SFS1524, HC-SFS2024, HC-SFS3524, HC-SFS7024 in (b) Section 5.2 (4): HC-RF(S)203, HC-RF(S)503 graph change Section 5.2 (5): HC-UF(S)202 graph change Section 5.2 (10): HA-LFS15K1M, HA-LFS22K2 graph change in (a), HA-LFS15K14 addition and HA-LFS30K14, HA-LFS37K14, HA-LFS11K1M4, HA-LFS15K1M4, HA-LFS22K1M4, HA-LFS30K1M4, HA-LFS37K1M4, HA-LFS45K1M4, HA-LFS50K1M4, HA-LFS15K24, HA-LFS22K24, HA-LFS45K24 graph change in (b) Section 5.3 (2): Remarks addition Section 5.3 (3): Remarks addition Section 5.3 (4): Remarks addition, text change Section 5.3 (5): Remarks addition Section 6.1: Correction to mistakes in writing Section 6.1 (2): Circuit diagram change Section 6.1 (4): Text addition Section 7.1.4: Text addition Section 7.1.11: Text addition Section 7.1.13 (1): Deletion of Note 3 from HA-LFS15K1, etc., addition of Note 3 to HA-LFS25K1 Section 7.1.13 (4)(b): Correction to mistakes in writing Section 7.2.11 (4)(b): Correction to mistakes in writing Section 8.1: Item deletion Appendices: Memo page deletion
Dec., 2005	SH(NA)3181-K	Safety Instructions (2): A precaution for wiring is added (4): A precaution for usage is added Service life of this product: added Service life of EEP-ROM: added Guarantee: added Conformance with UL/C-UL standard: Partially changed Section 5.1: HA-LF37K2 clerical error on rated current is modified to 204A, and maximum current is modified to 510A HC-KF23・43 clerical error on power rate at continuous rated torque is modified HC-KF23・43 clerical error on inertia moment ratio is modified HC-KF23・43 recommended load inertia moment ratio to a servo motor axis is modified HC-KFS23・43 clerical error on power rate at continuous rated torque is modified HC-KFS23・43 clerical error on inertia moment ratio is modified HC-KFS23・43 recommended load inertia moment ratio to a servo motor axis is modified Section 5.3 (2): Note about reduction ratio of the reduction gear is added Section 5.3 (3): Note about reduction ratio of the reduction gear is added Section 5.3 (4): Note about reduction ratio of the reduction gear is added Section 5.3 (5): Note about reduction ratio of the reduction gear is added Section 5.3 (4)(b): Point is added Chapter 7: Braking force is changed to static friction torque Section 7.1.1: HC-KF23・43 clerical error on inertia moment ratio is modified Section 7.1.2 (4)(b): Clerical error is modified Section 7.1.2 (5)(a): Clerical error is modified Section 7.1.2 (5)(b): Clerical error is modified Section 7.1.3 (3): Clerical error is modified

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May, 2008	SH(NA)3181-L	Safety Instructions 1. To prevent electric shock: WARNING: Partial change of sentence 2. To prevent fire: CAUTION: Partial change of sentence 4. Additional Instructions (2) Wiring: CAUTION: Addition of diagram and sentence (5) Corrective actions: Circuit diagram change COMPLIANCE WITH EC DIRECTIVE: (3) Addition of performing EMC tests Section 1.2 (2)(a): Rated output unit changed to [kW] Chapter 2: CAUTION: Partial change of sentence Section 2.6: Partial change of servo motor list Section 3.1: DDK connectors changed to RoHS compatible Section 3.2: DDK connectors changed to RoHS compatible Section 4.1: Addition of a sentence in WARNING reminding about confirmation of powering off charge lamp Section 5.1: Change of specifications of HA-LFS series and cooling fan power supply and current Section 5.2: Addition of 400VAC compatible HA-LFS series graph Section 5.3: Change of HC series permissible load inertia moment ratio Section 5.4: Partial change of shaft dimensions Section 5.4.1 (2): Key shaft (QK) dimensions of HC-UF/UFS (152K, 202K to 502K) modified Section 6.1: Addition of diagram and sentence

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