


D001(E)-AA

**Electric Blower Motor
HE Series
(UL,CE,GB)
Operating Instructions
and Warnings**

SDG

Thank you for purchasing this product.

These Operating Instructions and Warnings provide explanations on the specifications for the Electric Blower Motor **[HE Series]**.

In order to ensure **SAFE** and **EFFICIENT** use of this product, please read these Operating Instructions and Warnings carefully, **particularly the parts marked with the  mark.**

Please keep these Operating Instructions and Warnings at hand for your later reference.


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Disclaimer

- We do not take any responsibilities for damage that may be caused by fire, earthquake, conduct of a third-party, any other accidents, intentional or accidental abuse by a customer, misuse, or use under other abnormal conditions, of the product.
- We do not take any responsibilities for incidental damage resulting from the use, or non-use, of the motor, such as lost business profit, or loss from interrupted business.
- We do not take any responsibilities for damage caused by non-compliance with these Operating Instructions.
- We do not take any responsibilities for damage caused by malfunction, etc. due to poor compatibility with connected devices.

1. How to Read These Operating Instructions and Warnings

The  **Warning** mark in the text indicates that incorrect operation may lead to **accident resulting in death or serious injury, or fire.**

The  **Caution** mark in the text indicates that incorrect operation may lead to **accident resulting in injury, or damage to the product.**

2. Symbols



Prohibited
(applicable to all items)



Perform as instructed



Incorrect operation
may cause serious
injury



Disassembly
prohibited



Earthing required



Caution against
electric shock



Do not touch



High temperature

All the warnings and instructions should be strictly adhered to.

3. For SAFE Use of the Motor

Purpose of this motor

- This motor is designed for use with electric blowers made by Showa Denki Co., Ltd., and may not be used for other purposes.



Warning General

- Carrying, installation, piping/wiring, and maintenance and inspection shall be respectively performed by qualified persons.
Otherwise, **electric shock, injury, fire, etc.** may result.
- Do not work on the product while the lines are alive. Be sure to turn off the power at the main.
Otherwise, **electric shock or fire** may result.



Warning Delivering or carrying the unit

- Hold the frame with both hands while carrying the motor. Drop of the unit or fall of the carrying person may result in **injury** or damage.
- A suspending machine must have a rated load larger than the motor weight. Drop of the unit or fall of the carrying person may result in **injury** or damage.



Warning Installation in a hazardous ambient is strictly prohibited

This motor does not have an explosion-proof structure.

Operating the unit in a location with the risk of explosive atmosphere may lead to **explosion** of surrounding gas in the case of motor burnout.



Warning Precautions for installation

- Fasten installation bolts to the base and the flange faces at a proper torque.
Looseness may result in breakage, causing **injury**.
- Cover exposed rotating parts with a protective sheet, etc.
Otherwise, such parts may wind in a bodily part, etc., causing **injury**.





Warning To avoid fire and electric shock

Wiring must be installed by a qualified electric engineer, as per the electric equipment technical standards and the extension rules.



Warning Wiring precautions

- Turn off the power at the main before touching inside the terminal box.
Otherwise, **electric shock** may result.
- Take a measure at the main to prevent unintentional plugging in, etc. until work on the unit is completed.
- Fasten wiring screws at a specified torque.
Otherwise, **electric shock or fire** may result.
- Earthing is required. Otherwise, **electric shock or fire** may result from a short circuit.



Warning Operating precautions

- Do not operate the unit with the terminal box cover removed.
Otherwise, **electric shock** may result.
- If any abnormality occurs, immediately turn off the power at the main.
Otherwise, **electric shock or fire** may result.



Warning Operating precautions

- If power outage occurs, immediately turn off the power at the main.
Otherwise, **injury** may be caused when the power comes back on.
- Do not go near or touch the shaft or other rotating parts.
You may get **wound in and/or injured**.
- Do not insert a hand or finger into apertures. It may cause **injury**.



Caution Precautions for opening the unit

Do not open the unit upside down. Fall of the unit may cause **injury**.





Caution Precautions for installation

Do not touch key grooves on the machining part and on the edge of the motor with bare hands.
It may cause **injury**.



Caution Precautions for installation

When connecting the motor with the load, make sure to perform correct centering.
Confirm the rotating direction before connecting the motor with the load.



Caution Operating precautions

- Do not place combustible and/or blocking objects near the motor.
It may cause **fire**.



Caution Request for the attachment of a motor protective device

A protective device is not included in this unit. The electric equipment standards require attachment of a motor overload protective device. Please attach a required protective device.
It is also recommended to install other protective devices, such as a circuit breaker.



Caution Maintenance and inspection

- When measuring insulation resistance, do not touch the terminals.
Otherwise, **electric shock** may result.
- Do not clean the motor with solvent, etc. It may damage coating and lead to rusting.



Caution Maintenance and inspection

Before cleaning the motor, make sure to turn off the power, and wait until the motor body is sufficiently cooled down.





Caution Do not disassemble

Never disassemble, renovate or repair the unit. It may cause a defect or accident.

For request for repair, contact our branch or sales office nearby, as listed on the back cover of this document.



Caution Discard

Discard this motor as a general industrial waste.



Caution Use of an inverter

Inverters can only be used for three-phase 200V-class motors. When the use of an inverter is planned for any motor other than 200V-class, make sure to contact us on the possibility of special design.



Caution High temperature

- Do not let your hand or body come into contact with the motor during its operation or immediately following its stop.

It may cause a **burn**.



Caution Installation

Install the unit in an indoor location, where the ambient temperature is $\leq 40^{\circ}\text{C}$.

Please use the outdoor type motor for outdoor use.



4. Check upon Delivery

Although we test and inspect carefully before shipment, please double-check the following points for the delivered motor.

- Is it the exact product that you ordered?
- Is the unit free from abnormality due to transport, such as **damage and deformation**?
- Are all the set items enclosed?

Set items

Motor	1
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Standard accessories

Operating Instructions and Warnings	1
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5. Storage of the Motor

When the motor is to be stopped and stored for a long time (three months or longer), please take the following precautions:

- (1) In the case of packaged storage

Store the package in a dry indoor location with few temperature changes.

- (2) In the case of installed stoppage

Protect the motor from **large vibration** or **heat** generated by other machines.

It is recommended to cover it with a plastic sheet etc. for protection from water, oil, dust and so on.



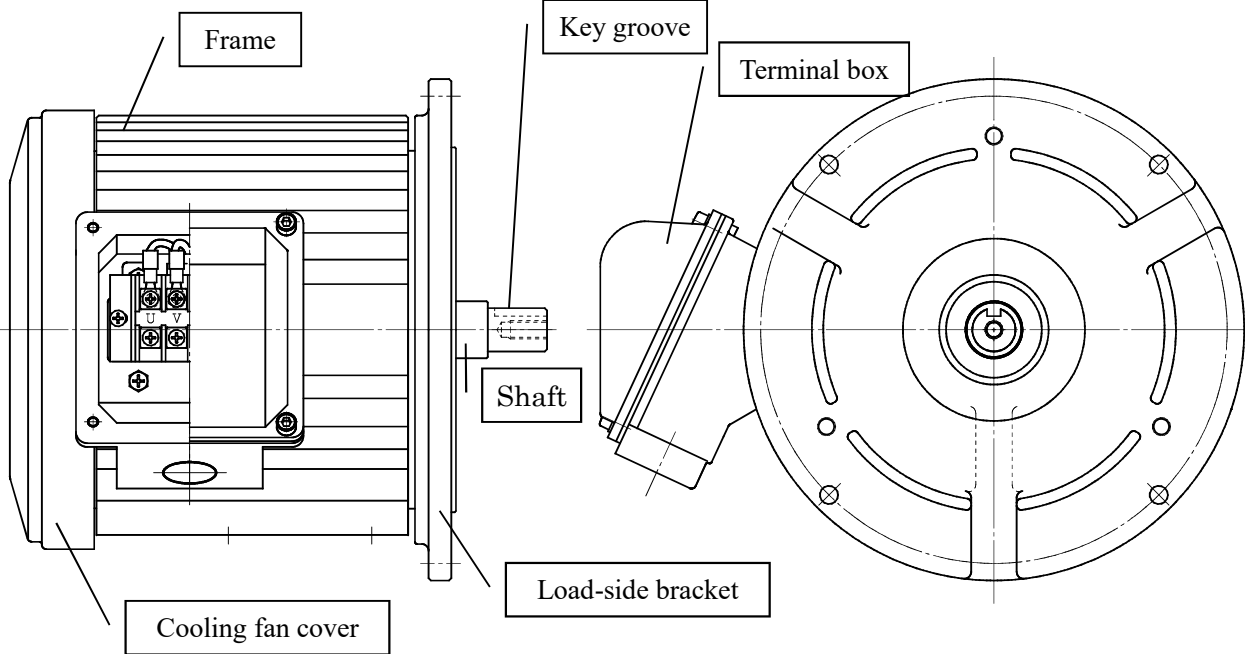
Caution Maintenance and care during storage and stoppage

If the shaft of the motor is stopped for a long time (three months or longer), rust may form depending on the season and environment during the storage/stoppage, which may cause abnormal noise after re-start.

Please undertake trial operation once about every three months.



6. Shapes and Names of Parts



7. Label Indications

(1) Product name plateBody

Note 1. "Rated" refers to the specified limit values.

Example of model indication.

HE - 3 7 - Y 4 3

1 2 3 4

Description of model indication.

1	Rated output	04:0.56 kW 07:0.75kW
		10:1.0kW 15:1.5kW
		22:2.2kW 37:3.7kW
2	Installation	X:indoor use
		Y:outdoor use
3	Rated voltage	1:200V 2:230V
		4:380V 5:400V 6:460V
4	Rated speed	1:50Hz 2:60Hz 3:50Hz/60Hz

(2) Direction of rotationBody outer fan cover



Indicates the direction of rotation of the motor.

(3) EarthingTerminal block



mark indicates the earthing point. Make sure to connect an earth cable to this point.

8. Installation

(1) Ambience

Install the unit in an **indoor** location, where the ambient temperature is $\leq 40^{\circ}\text{C}$.

Please use the outdoor type motor for **outdoor use**.

Protect the motor from **large vibration** or **heat** from other machines.

Install the unit so that the rotating shaft becomes level.

Secure a gap of about 80 centimeters in front and on both sides of the unit, in order to enable inspection, repair and other necessary activities.



Warning Surrounding atmosphere

Acid, alkali or other corrosive gas remarkably shortens the lifetime of the motor.

Never install the unit in an atmosphere with the risk of generation of combustible or explosive gas, which may lead to a major accident, such as fire and explosion.

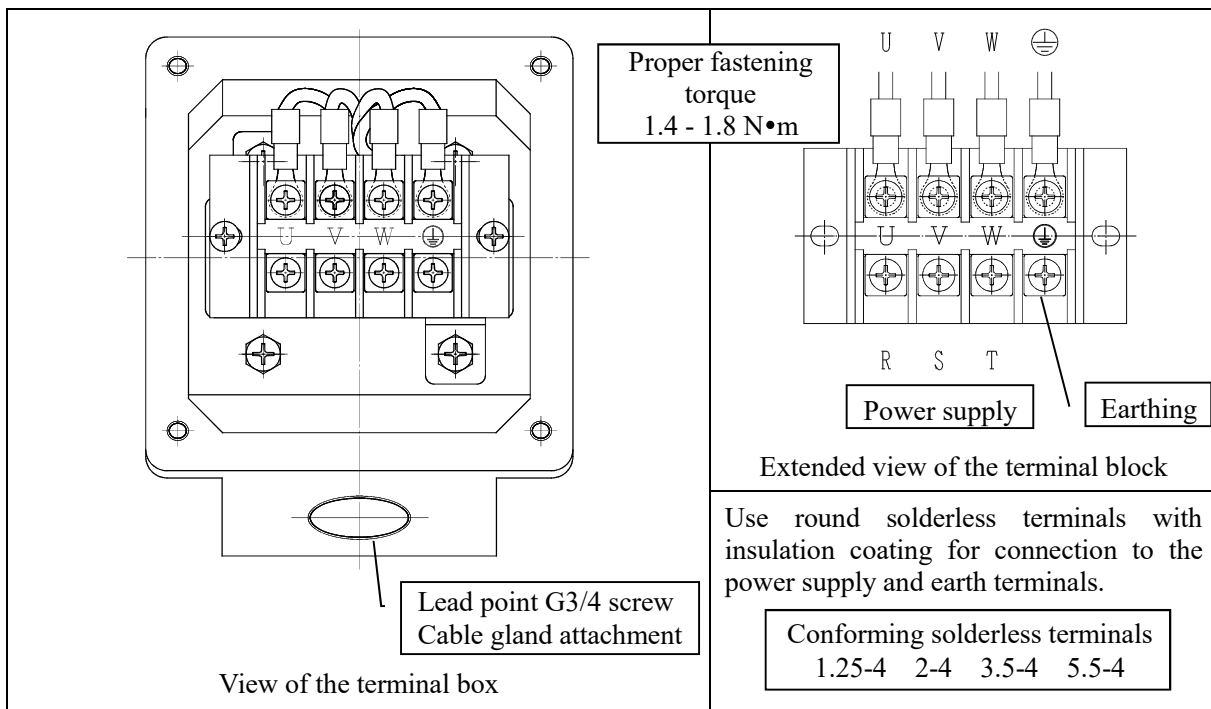


If it is planned to use the unit with its rotating shaft in an upright position, make sure to contact us beforehand.




9. Wiring

Connect the lead wires of the motor as illustrated below.





Warning

- Wiring for the blower must be installed by a qualified electric engineer as per the electrical equipment technical standards and the extension rules.
- Make sure to earth the unit to prevent electric shock.
Connect an earth cable to the earthing terminal, which is located near the  mark.



Caution

- Please attach an overload protective device before use. It is also recommended to install other protective devices, such as a circuit breaker.
- Fixate cables to the cable lead point on the terminal box using a cable gland, so that tension will not be applied to the connection terminals.
- Use an outlet with the **rated voltage and rated frequency** indicated on the product name panel.
- Voltage regulation should be **within $\pm 5\%$ from the rated voltage**.
(Temporary variation to $\pm 10\%$ is acceptable.)
- Frequency variation should be **within -5% to $+3\%$ from the rated frequency**.
- Current should be up to the rated current.



Precaution for a three-phase motor

In the case of a three-phase motor, rotation continues even though one of the three cables gets removed following the startup of the motor, as long as other two cables remain connected. However, this causes overload and leads to motor burnout (so-called "single-phase burn").

[To avoid this, make sure to connect all of the three cables of a three-phase motor.]



Capacities of wiring and connected devices (for reference)

Voltage	Motor output	Minimum copper wire diameter for wiring	Maximum tolerable wiring length	Local switch capacity	Local overcurrent breaker capacity	Excess ampere meter	Minimum copper wire diameter for an earth cable
[V]	[kW]	[mm]	[m]	[A]	[A]	[A]	[mm]
200	0.4	1.6	81	15	5	5	1.6
	0.75		54		10		
	1.0		44		15	10	
	1.5		32		20		
	2.2	2.0	23	30	30	15	
	3.7						

10. Use of a Frequency Inverter

(1) Operating voltage

When an inverter is used for this product, inverter input voltage should be 200 V.

An inverter with a differing voltage zone (380 - 460 V) may cause failure of the product, due to excessive surge voltage that destroys insulation of the winding. (If the receiving voltage of the inverter is ≥ 380 V, high surge voltage occurs even though the inverter's output voltage is set at ≤ 200 V.)

(2) Lowest and highest frequency

1) Lowest frequency

The lowest frequency should be ≥ 10 Hz. (Below 10 Hz, the unit may not start up because the startup torque is too small. If the motor does not start up at a low frequency setting ≥ 10 Hz, use a higher frequency that enables startup.

Motor burnout may occur if the unit is left in a condition unable to start up.)

2) Highest frequency

The highest frequency should be up to the rated frequency indicated on the name plate. (Use of the unit at a frequency higher than that indicated on the name plate leads to overload, and may cause motor burnout. Increased centrifugal force may also lead to deformation of or damage to the impeller of the blower.)

(3) Conditions that may accompany the use of an inverter

1) Abnormal noise

Abnormal noise may be reduced by changing the carrier frequency. Follow the operating instructions for the inverter. (Abnormal noise may occur during inverter operation because the voltage wave pattern is not favorable for the commercial power supply, and due to the higher harmonic wave.)

2) Resonance

The product lifetime may get shortened through continued use under a condition with large vibration. Please avoid the resonant points during use. (At a specific frequency, vibration may become larger due to resonance, because of the natural frequency of the motor.)

3) Temperature rise

During inverter operation, temperature of the winding rises higher than with the commercial power supply.

4) Startup and shutdown

In cases where the inertial moment is large, long startup/shutdown time may cause a trip of the inverter. (Please change the inverter setting for startup/shutdown time.)

5) Others

For details, please consult the operating instructions for the inverter.

11. Precautions for Use

Precaution	Result that may follow incorrect operation
Some blowers may get overloaded at 60 Hz. Current should be up to the rated current.	Motor burnout may occur.
In principle, do not turn on and off the power repeatedly in less than one minute.	Motor burnout may occur.

12. Maintenance and Inspection

(1) Periodic inspection

Please check for vibration and abnormal noise once every three months, and for insulation status once every year.

Greasing of the motor bearing is not necessary because sealed ball bearing is used.

The grease lifetime varies substantially depending on the environment of use. One year is a reference interval for re-greasing.



Warning

Before starting work, make sure to double check that the **power switch has been turned off.**

At the same time, place a tag or the like that indicates "**Work in Progress - Do Not Turn On**" over the power switch until work is completed.



13. Troubleshooting

Load	Failure status	Possible causes		Solutions
The motor does not start up with no load.	No sound	Breakage of the stator winding (three-phase)		Have the unit repaired at a specialized factory.
		Non-motor cause	Breakage of the power cable	Check the power cable.
			Switching defect	Check the contact point of the switch.
	Snarling sound	Breakage of one phase of the power cable		Check the power cable.
		Imbalance of three-phase voltage		Check the power supply.
		Breakage of the stator winding		Have the unit repaired at a specialized factory.
		Contact between the stator and the rotor	Bearing friction	Replace the bearing and/or repair the contacting part.
	Pinched foreign object		Remove the foreign object.	
	Unwanted closure of the switch	Short-circuited lead wire		Repair the lead wire.
		Improper switch capacity		Replace the switch with a proper one.
Adhesion of the electromagnetic contact		Replace the electromagnetic contact.		
The motor rotates with no load.	Slow rotation following startup	Imbalance of three-phase voltage		Check the power supply.
		Large voltage drop		Check the thickness of the power cable.
		Damage to the electromagnetic contact		Replace the electromagnetic contact.
	Snarling sound	Uneven clearance between the stator and the rotor		Inspect whether the connection between the motor and the load machine is appropriate. Have the unit repaired at a specialized factory.
		Contact between the stator and the rotor (Overheating due to overcurrent)		Have the unit repaired at a specialized factory.
		Short circuit of one phase of the stator winding (Overcurrent)		Have the unit repaired at a specialized factory.
		Breakage of the stator winding		Have the unit repaired at a specialized factory.
	Abnormal noise at a regular interval	Bearing defect		Replace the bearing.

Load	Failure status		Possible causes	Solutions	
The motor rotates with no load, but does not when loaded.	Motor halt		Excessive load applied by the connected machine	Inspect the load status.	
			Bearing burnout	Replace the bearing.	
			Motor halt under load due to damage to the electromagnetic contact	Replace the electromagnetic contact.	
	Overheating	Stator	Excessive load applied by the connected machine	Inspect the load status.	
			High ambient temperature	Secure ventilation.	
			Blocked ventilation	Clear the airway of any attached foreign object.	
	Large vibration		Insufficient strength of the installation platform	Bolster the installation platform.	
			Loosened installation bolts	Fasten up the installation bolts.	
			Vibration of, or shock to, the connected machine	Inspect the load status.	
			Bearing defect	Check the bearing.	
	Overheated switch		Insufficient switch capacity	Replace the switch with a proper one.	
			Excessive load applied by the connected machine	Inspect the load status.	
	Abnormal noise during operation		Open-phase operation	Check the three-phase power supply or the stator winding.	
			Imbalance of three-phase power supply	Check the power supply.	
	Load is applied from the motor startup.	Overheated switch		Insufficient switch capacity	Replace the switch with a proper one.
				Excessive load applied by the connected machine	Inspect the load status.
Adhered contact point of the electromagnetic contact				Replace the electromagnetic contact.	
Slow rotation following startup		Damage to the electromagnetic contact	Replace the electromagnetic contact.		
		Imbalance of three-phase voltage	Check the power supply.		
		Large voltage drop	Check the thickness and length of the power cable.		
Inability to start up		Imbalance of three-phase voltage	Check the power supply.		
		Large voltage drop	Check the thickness and length of the power cable.		
		Excessive load	Inspect the load status.		

14. Warranty

(1) Range of warranty

Repair service is provided free of charge for a failure during the warranty period, as long as the unit has been used in compliance with these Operating Instructions, labels attached to the body, and other instructions.

In the case that this product is incorporated into other equipment used by the customer, warranty does not cover costs on removal from such equipment, re-attachment to such equipment, costs on other incidental work, costs on transportation etc., resulting opportunity loss incurred by the customer, lost operation time, or any other indirect loss or damage suffered by the customer.

(2) Warranty period

One (1) year from the date of delivery of the product.

Even during the warranty period, only payable service is provided in principle, if any of the following applies:

- 1) Failure or damage due to incorrect use that is not compliant with these Operating Instructions, labels attached to the body, or other instructions, and/or unauthorized repair or renovation
- 2) Failure or damage due to transportation, drop etc. after the purchase
- 3) Failure or damage due to fire, earthquake, storm, flood, lightning or other disaster, abnormal voltage, use of power supply (voltage or frequency) other than specified, or the like
- 4) Failure or damage due to repair or renovation (including punching etc. in the product) not conducted by our company
- 5) Failure or damage due to the use of parts other than those designated by our company
- 6) Failure or damage due to the entry of a foreign object
- 7) Discoloration, scratch, natural consumption of consumable parts or other defects due to use or deterioration over time.

15. Inquiries

For inquiries about this product, please contact your local sales office. When asking about a problem or repair, please state the product name(TYPE) and serial number (No.) listed on the nameplate.

For the latest information on our sales offices, please check our website.

List of sales offices



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SDG CO., Ltd.

<https://www.sdg-eng.com>

