010(E)-AC

Direct Drive Blower

Operation Manual & Cautions



SDG

Thank you for purchasing blowers.

This operating instruction manual contains operating instructions and cautions for **[standard and heat-resistant models]**.

In order to use the blower **[safely]** and **[efficiently]**, please read these instructions and cautions **[particularly those marked ⚠]** thoroughly.

Keep this manual carefully where it can be referred to when necessary.

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1. How to read this operating instruction manual / cautions list

⚠ **Warning** : Incorrect operation may cause serious personal injury or death or a fire.

⚠ **Caution** : Incorrect operation may cause serious personal injury or damage to the unit.

2. Warning and caution symbols


Prohibited
(applicable to all items)


Perform as instructed.


Incorrect operation
may
cause serious injury.


Disassembly prohibited.


Grounding required


Caution against
electric shock


Please contact us

Always follow warnings and instructions.

3. Carrying

⚠ **Warning:** Carrying or unpacking the product.

If the hanging is incomplete at the time of loading, the blower will fall and cause injury.

Please check the top and bottom before unpacking. Also, for wooden crate packing, please pay attention to nails.



4. To use the blower safely

Warning: Installation in a dangerous place is strictly prohibited

This blower is not an explosion-proof structure.
When operating in a place that may have an explosive atmosphere, when the motor (electric motor) burns out (burns out and breaks), the surrounding gas will "**explode**", causing a hazard.



Warning: To prevent fire or electric shock

Electric wiring of the blower should be performed only by a licensed electrician.



Warning: Never remove the wire mesh from the blower intake

Never remove the wire mesh from the blower intake.
Furthermore, never insert your hand into the blower via the blower intake or outlet. Doing so may result in injury to your **[fingers or wrist]** .
Also, never insert rods or other objects. Doing so may result in the object being wound up onto the blower or being crushed, resulting in injury or damage to the blower.



Caution: Automatic return of motor protection device

If the motor protection device is built-in (see the applicable models) and the motor stops due to overload caused by overheating, turn off the power immediately.
With this type, the motor protection device will automatically return and the motor will start when it cools down, causing a hazard.
Remove the cause of the motor overload, confirm that the motor has cooled down, and turn on the power again to start the motor.
Applicable models (standard products)
EC-63S/T, EP-63S/T, SF-38, SF-50, SF-55S, SB-151, SB-201, SB-202
*Please refer to the delivery specifications as specially supported items differ individually.



⚠ Caution: Precautions when using high efficiency electric blowers

High-efficiency motors (IE2 or IE3) are designed to have lower motor resistance to reduce losses than standard (IE1 or equivalent) motors.
This may increase the starting current depending on the product. When replacing our conventional products with a high efficiency electric blower, it may be necessary to change the breaker, etc.



⚠ Caution: Regarding use of inverters

Single-phase motors do not use inverters.
Inverter operation can be performed only with 3-phase 200V-class motors. Be sure to contact us when using inverters for motors other than the 200V-class. Refer to p.13～14 for more information regarding the use of inverters.



⚠ Caution: Disassembly prohibited

Never disassemble the motor or casing interior.
Doing so may result in malfunction or accident.



5. Inspection when unpacking

The units are shipped after careful inspection; however, be sure to check the following points regarding your purchased blower.

- Is the product the one you ordered?
- Did any abnormalities such as breakage or deformation occur during transportation?
- Are there any missing parts?

6. Storage of the Blower

Please be careful of the following if the blower will not be operated or will be stored for a long period of time (3 months or longer).

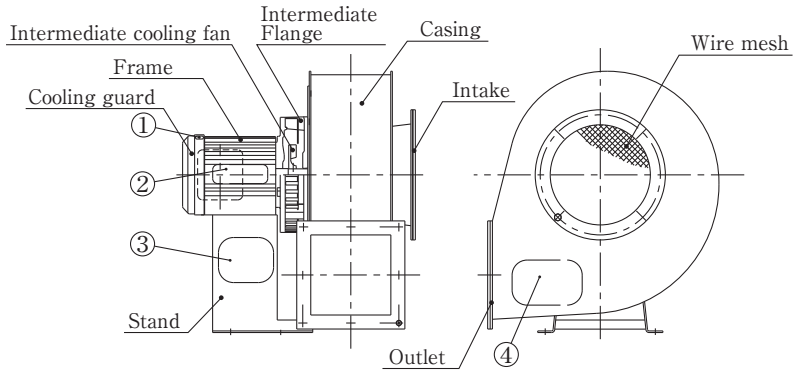
(1) When storing wrapped up:
Store in a dry location with little temperature variation.

(2) When it will be left installed but not operated:
Be careful that it is not subject to **[large vibrations]** or **[heat]** from other equipment.
Cover the blower with plastic sheeting to protect it from water, oil, dust, etc.

> ⚠ **Caution:** Protective maintenance during storage or non-operation
>
> When the blower fan shaft bearings are stopped for a long period (3 months or longer), rust may be generated depending on the season and ambient conditions, resulting in abnormal noise during operation.
> Test operation should be performed approximately once every 3 months.

7. Indication label details and attachment position

The attachment positions for various indication labels vary depending on type; however, a label is attached to one of the following positions ① to ④.
① Cooling guard top face ② Frame ③ Stand ④ Outside of casing



The information stated on the various labels is as follows.

(1) Model plate

Displays the product classification, rated voltage, rated frequency, rated current, insulation class, maximum static pressure, maximum blow volume, product model, etc.

Note 1: "Rated" means operating limits.

Note 2: "Static pressure" means the pressure applied to a surface parallel to the air flow.

(2) Rotation direction label



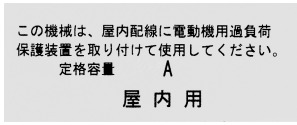
Indicates the direction of rotation of the fan. Be sure to check this label before test operation. (Some models have the indication molded into the casing.) If reverse operation is performed, the blow volume and blow pressure will be reduced. In addition, the load will be increased, which may result in burn damage to the motor.

(3) EARTH mark



Connect a grounding wire to the earth (ground) terminal near the above EARTH mark. (Some models have the indication molded into the casing.

(4) Install motor protection devices label



Blowers having this label should be used after installing motor protection devices. (This is an explanation for complying with the laws in Japan.)

(5) Take safety precautions for hot parts label



When using the heat-resistant model with **[intake temperatures of 60°C or greater]**, the surface of the blower and connecting ducts (air pipes) will become hot. Be sure to take safety precautions.

(6) "Keep Hands Out" label



Do not put your hands into the inlet or outlet. There is a risk of injury.

8. Ambient temperature and intake temperature

(1) Install in a location within the following ranges for installation atmosphere (surrounding the blower).

Single-phase/three-phase classification	Single-phase blower	Three-phase blower
Ambient temperature	-5 to 40°C	-10 to 40°C

Motor protection type	Open type	Fully enclosed type/ Fully enclosed external fan type
Ambient relative humidity	80% or less	90% or less

(2) Intake temperature and intake humidity

Temperature/ humidity / Model classification	Allowable intake temperature	Allowable humidity with no condensation (water droplets)
Standard model (SF, SB, FS, U100 series, AH series 1.0kW or less)	- 10°C to 40C°	Relative humidity: Less than 90%
Standard model (E, KSB, U75 series, AH series 1.5kW or higher)	- 10°C to 60C°	Relative humidity: Less than 100%
Heat-resistant model	*180°C maximum 200°C maximum 250°C maximum	Relative humidity: Less than 100%

*For heat-resistant models, the allowable intake temperature depends on the model. Please refer to the catalog or contact your nearest sales office.

9. Intake Substances

(1) Never let the blower suck in volatile gases, organic solvents, sparks, lighted cigars, etc. Doing so may cause an explosion, fire or damage to the product.

(2) Suction of substances other than air

In the case of intake of substances other than air, be sure to contact us.

(3) Condensation and corrosion

① If air with a relative humidity of 100% or higher is sucked in, condensation (formation of water droplets) may occur due to temperature variations. If air containing water droplets is sucked in, water may **[leak from the bearing perforations]** . This may cause motor burnout or electrical leakage.

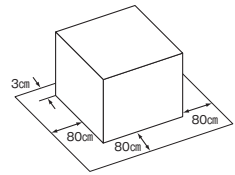
② If air with a relative humidity of 90% or higher is continually sucked in, **[corrosion]** may occur in parts which come in contact with the air, depending on the part material. In some cases, this may also shorten the life of the blower.

③ Depending on the region or season, when the temperature difference between the intake air and the air surrounding the blower is high, condensation is likely to occur immediately after the start of operation even if the relative humidity is less than 100%.

If air containing water droplets will be sucked in, or if slight corrosion is not permissible, be sure to contact us

10. Installation

Install in a location where the blower will not be subject to **[large vibrations]** or **[heat]** from other equipment. Install with the axis horizontal. Install with a gap of at least 3cm between the back of the blower and the wall to allow intake of cooling air. Leave a space around the blower of around 80cm in all directions for inspection and maintenance.



When the blower will be used with the axis vertical, be sure to contact us.

Warning: Ambient atmosphere

The presence of corrosive gases such as acids or alkalis will shorten the life of the blower.

[Never install in a location where flammable or explosive gases may occur. Installation in such locations may result in major accidents such as [fire] or [explosion] .]

Caution: When exhaust air is released in the air:

Be sure to attach a **[wire mesh]** to the outlet. If a hard object is sucked in and blown out, an injury or accident may occur.

Warning: Be sure to take actions against high-temperature sections

When using the heat-resistant model with **[intake air temperatures of 60°C or greater]** , the surface of the blower and connecting ducts will become hot and may result in burns if touched. Please take safety precautions such as surrounding the blower and ducts with fencing or wire mesh.

Never place an object on the heat-resistant blower, connection duct, etc. Doing so may cause a fire.

Caution: When installing a heat insulator

Do not wrap the intermediate cooling fan of heat-resistant models with insulation. (Refer to Figure on p.4.) Doing so will prevent the release of heat and cause the bearings to deteriorate more rapidly.

11. Piping

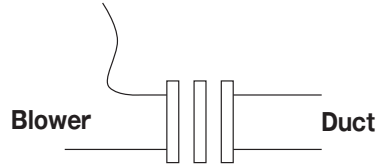
(1) Connection to intake and outlet

For connection to the intake and outlet, always use an expandable/contractible fitting (flexible fitting) or duct hose which can expand and contract.

(2) When ducts must be connected directly to the intake or outlet

Align the axes of the intake/outlet and duct (tubing) and tighten so that the blower flange surface and the duct flange surface are parallel.

Be sure to provide support for the ducts so that no load is applied to the intake or outlet. Installing packing between the two flanges will make installation easier.



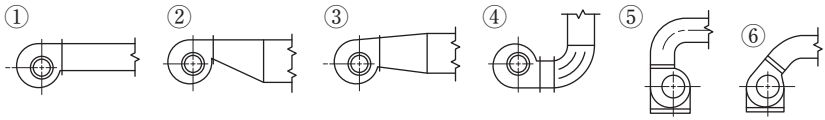
When using the heat-resistant model with **[intake air temperatures of 60°C or greater]**, be sure to take **[thermal expansion]** into consideration and use heat-resistant fittings to prevent heat expansion of the ducts.

(3) Connection to ducts

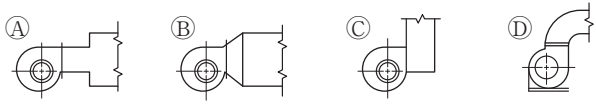
If the duct which will be connected is curved or suddenly gets larger or smaller, the blow volume or static pressure may be reduced and additional operating noise may occur.

Duct connection examples

○Examples of good duct connections



×Examples of poor duct connections



(4) Drain piping

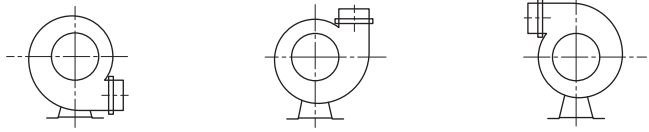
For products with drain outlets, provide piping to ensure that liquids are discharged. If drain piping is incomplete, it may cause the floor or wall to become dirty. In addition, if the discharge is not smooth, water, etc. may accumulate in the casing, leading to overloading of the motor at startup and causing damage such as burnout.

12. Changing the outlet blow direction

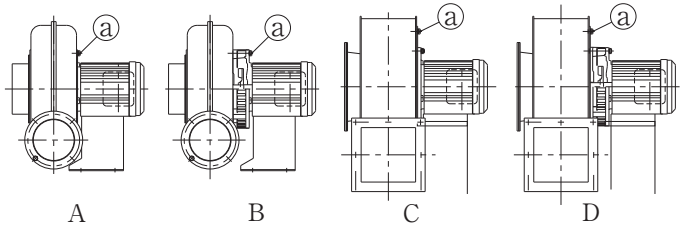
(1) If a specific exhaust direction is not requested, a standard model is shipped with the blow direction set to "horizontally from bottom".
The outlet direction of all blowers can be changed to vertically from the top or horizontally from the top. (However, SF-38 standard models and heat-resistant models have 3 mounting points between the casing and motor, so that the outlet blow direction can be changed to a 120° upward or downward angle from horizontal.)

(2) Rough diagram of outlet direction

① Horizontally from bottom ② Vertically from top ③ Horizontally from top



(3) Mounting structure of outlet direction change section
For casing and motor attachment, the following 4 methods can be used.



A. Structure in which the casing is attached directly to the motor.
B. Structure in which an intermediate flange is installed with long bolts between the casing and motor.
C. Structure in which a motor flange is installed between the casing and motor so that outlet direction change section will be attached to motor flange and casing.
D. Structure in which a motor flange and intermediate flange are installed between the casing and motor so that outlet direction change section will be attached to motor flange and casing.

(4) Outlet direction change method 1 (Models with the structures in Figs. A, C and D)

① Position the blower with the outlet facing downward.

② Remove bolt ⓐ.

③ Rotate the motor and mount it in the designated direction.
If the motor is lifted up at this time, the shaft seal position may be misaligned; therefore, slide the motor instead of lifting to rotate the motor.

④ Tighten bolt ⓐ. (In the AH series, adjust the unit so that the clearance between the intake cone and fan becomes uniform on the left, right, top and bottom sides.)

⑤ Rotate the fan by hand to verify that it rotates easily.

(5) Outlet direction change method 2 (Models with the structure in Fig. B.)

① Remove the outlet. (Please be careful not to break the packing.)

② Remove the casing at the intake side.

③ Remove the impeller.

④ Remove bolt ⓐ and change the outlet direction.

⑤ Adjust the clearance between the shaft and seal holder. (Adjust so that the shaft does not come into contact with the metal plate at the shaft penetration part.)

⑥ Tighten bolt ⓐ and attach the outlet.

⑦ Reattach the impeller.

⑧ Reattach the intake casing. (Use caulking agent to prevent air leakage.)

(Note) When it is necessary to change the blowing direction, request us to do so. If your desired direction was specified at the time of order, a blower with the specified blowing direction will be delivered.

⚠ Caution

Never disassemble the motor part.
The caulking method of the joint surface varies depending on the product, so apply a caulking agent that meets the specifications.
In addition, if a problem occurs after the discharge direction is changed, please contact the local sales office.



13. Wiring

⚠ Warning

The wiring of the blower should be carried out in accordance with the applicable laws of the country in which it is used.
Use the blower after installing a ground-fault breaker and overload protection devices.
To prevent electric shock, be sure to connect the ground wire to the terminal for ground wire marked with.



Recommended tightening torque of terminal block

Screw size	Tightening torque
M3.5	0.87 Nm (max 0.96 Nm)

⚠ Caution

Use a power source within a rated voltage and frequency specified on the model plate.



Voltage variation should be within ±5% of the rated voltage. (Temporary variation to ±10% is acceptable.)
Current should be used within the rated current value.



The label or molded indication on the blower shows the rotation direction. After wiring has been completed, reconfirm the rotation direction during trial operation. If a three-phase motor product has reversed rotation, replace two of the three wires of the power wiring.



Single-phase and three-phase differences and precautions
With single-phase (single-phase AC) products, two wires are connected from the power supply. If you do not connect both of them, the motor will not rotate. With three-phase (three-phase AC) products, three wires are connected from the power supply. With three-phase, even if one of the three wires becomes disconnected after the motor is started, if the remaining two wires are connected, the motor will continue to rotate, but in this case it will be overloaded, so the motor will burn out.
[Be sure to connect all three wires of three-phase blowers]



14. Attention on use

Caution	Effect/Phenomenon
When operating some blowers at 60Hz, overload may occur. Operate within the rated current range.	May cause motor burns.
In principle, do not repeatedly switch the power on and then off at intervals of less than one minute.	May cause motor burns.
When using the heat-resistant model with **[intake air temperatures of 60℃ or greater]**, when shutting down, wait until the intake air temperature has become 120℃ or less before shutting down.	Since the intermediate cooling fan will also stop, heat will not be released. This will cause the bearings to deteriorate more rapidly.

15. Use of inverters (frequency converters)

(1) Lower and upper frequency limits

① Lower frequency limit

The lower frequency limit should be 10 Hz or more. (The starting torque will be small when it is set to less than 10 Hz, so there is a possibility that the motor will not start. If the motor does not start when the frequency is set to a low value, please use a frequency at which it will start even if it is above 10 Hz. If the motor is left unstarted, there is a possibility that it will burn out.)

② Upper frequency limit

The upper frequency limit should be less than or equal to the frequency stated on the nameplate. (If a frequency above the value stated on the nameplate is used, it will cause overload and there is a possibility that the motor will burn out. In addition, there is a possibility that the impeller may be deformed or damaged due to an increase in centrifugal force.)

(2) Different voltage

For different voltage products (380-460 V), the surge voltage will be high and the insulation of the winding will be broken, which may cause a failure. Please be sure to contact us about the availability of custome made. (If the receiving voltage of the inverter is 380 V or more, a high surge voltage is generated even if the output voltage of the inverter is 200 V or less.)

(3) Possible events caused by using an inverter

① Abnormal noise

Abnormal noise may be reduced by changing the carrier frequency. In addition, please follow the instruction manual of the inverter for use. (In the case of inverter operation, abnormal noise may occur due to bad voltage waveforms and harmonics with commercial power supplies.)

② Resonance

If the product is used in a state where the vibration is large, the life of the product may be shortened, so please avoid resonance points. (At certain frequencies, the natural frequency of the blower may cause vibration to increase due to resonance. This may be caused by piping, installation method, etc. Resonance may also occur depending on the piping method, so please avoid direct piping as much as possible.)

③ Temperature rise

The temperature rise in the winding is higher when using an inverter than when using a commercial power supply.

④ Start-up and stopping

Depending on the size of the impeller's moment of inertia, the start-up time and stopping time may be long, and the inverter may trip. (Please change the start time and stop time settings of the inverter.)

⑤ Heat-resistant models

For heat-resistant models, heat dissipation may be insufficient due to the following reasons. (In order to prevent motor burnout, it is recommended to change to the specification to a type with burnout prevention terminals. Please contact us for details.)

- When the speed of the cooling fan is reduced.
- When thermal insulation is used around the intermediate cooling fan (figure on page 4) and the gap is small. When the speed of the intermediate cooling fan is also reduced.

In addition, long-axis products are more prone to vibration at start-up. When vibration occurs, please review the start-up time, carrier frequency, etc.

⑥ Other

For details, please refer to the instruction manual of the inverter to be used.

16. Maintenance inspection

(1) Periodic inspection

①It is recommended that inspection for vibration and abnormal noise be performed every 3 months, and that insulation be inspected annually.

②Rubber contact seals (V-rings, oil seals, etc.) used in the shaft seal will deteriorate due to rotational wear, and gaskets used in the suction and discharge port will deteriorate over time.

Although deterioration varies depending on the operating environment, we recommend replacing shaft seals and packings at the time of bearing replacement (approximately one year).

③When using heat-resistant models or when suctioning air that contains high humidity or dust, corrosion of the gas-contacting parts (inside of the casing and the impeller etc) and wear (abrasion) of the rotating contact parts may become severe depending on the operating environment. Therefore, the inspection interval should be shortened.

④Since sealed ball bearings are used for the motor bearings, bearing lubrication is not necessary.

Grease life varies according to the operating environment, but is generally approximately one year.

	Clearance	Grease
Standard type	CM gap	Multemp SRL (lithium-type)
Heat-resistant type	C3 gap	Multemp SRL (lithium-type)
High efficiency (standard/heat resistant)	C3 gap	ENS grease (urea type)

17. Warranty

(1) Scope of warranty

When a malfunction occurs even if operating the unit according to the instruction manual and the cautions on the attachment labels, etc. within the warranty period, we will repair the failure for free.

However, if this unit is assembled into the customer's other equipment, expenses for removal from the equipment and attachment to the equipment, accompanying work expenses, transportation costs, and other indirect damages cost such as opportunity loss or operational loss of customers are beyond the scope of warranty.

When requesting repair, contact our nearest branches and sales offices.

(2) Warranty period

The warranty period shall be one year from delivery.

(3) Even within the scope of warranty, the following cases shall require charge for repair in principle.

① Malfunctions and damages due to incorrect use other than as described in the instruction manual and cautions list

② Malfunctions and damages due to repair and modification (including drilling into the unit) by third parties.

③ Malfunctions and damages due to transportation, dropping, etc. after purchase.

④ Malfunctions and damages due to fires, earthquake, wind and flood damages, other disasters, abnormal voltages, use of unspecified power supply (voltage and frequency), etc.

⑤ Malfunctions and damages due to use of parts other than those specified by us.

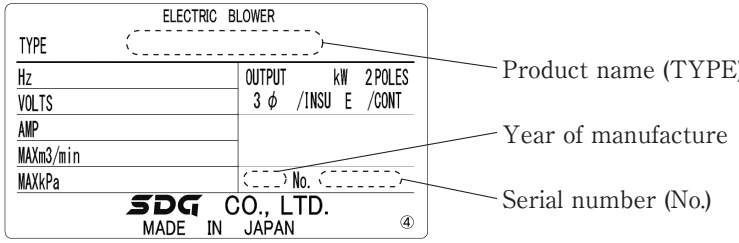
⑥ Malfunctions and damages due to mixing in of foreign materials.

⑦ Discoloration and flaws from age deterioration or from long-term use and malfunctions due to natural consumption of consumable parts.

(4) Damages caused by malfunctions occurring during use of this unit shall not be indemnified.

18. Contact Information

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

19. Disposal

Follow laws and regulations when disposing of products.

SDG CO., Ltd.

https://www.sdg-eng.com