Instruction Manual

Compact Axial Fan

Induced draft fan　　Model SF

⚠ Warning

Do not carry out operation, inspection or maintenance of the fan until you read this manual and understand the contents.

Keep this manual carefully at hand so that it can be consulted anytime when operating, inspecting or maintaining the fan.

For contractors who carry out equipment work:

Please be sure to deliver this manual to user(s) who will carry out operation, inspection and maintenance of the fan.

株式会社タニヤマ
TANIYAMA CO.,LTD.

Limited warranties

1. In the event of a failure or breakage under proper use of the product during the warranty period, equipment supplied by Taniyama Co.,Ltd. shall be repaired or replaced free of charge within the scope of the relevant part, provided that such failure or breakage is attributable to inadequacy of the design or workmanship of the equipment.
2. The warranty mentioned in the above clause shall be only the mechanical warranty of the defective part, and shall not cover any expenses or other damage arising from the failure or breakage.
3. In the event of the following failures and breakage, the costs of the repairs shall be borne by the user.
   (1) Failures and breakage attributable to equipment that was not delivered by Taniyama Co., Ltd.
   (2) Failures and breakage after the expiration of the warranty period
   (3) Failures and breakage caused by disasters or force majeure, such as fire, acts of God or earthquakes
   (4) Failures and breakage resulting from repairs or modifications made without the consent of Taniyama Co., Ltd.
   (5) Failures and breakage when parts other than those specified by Taniyama Co.,Ltd. are used
4. Taniyama Co., Ltd. shall not be liable for any damage caused by incorrect or reckless use of the fan. Cost and expenses incurred for sending engineer(s) in such a case shall be borne by the user.
5. If the cause of the failure is unclear, necessary actions shall be determined through mutual consultation.

Purpose of this manual

The purpose of this manual is to provide the user with detailed information necessary to properly operate, maintain and inspect the fan.
This manual contains the following information and has been prepared to assist the persons experienced in the operation of fans, or for those who have been trained by such experienced operators. Only qualified personnel such as licensed electrical engineers are allowed to carry out the electrical wiring work.

Contents

1. Safety precautions

1.1 Safety indications and their meanings

This instruction manual divides precautions into the following four categories according to the level of hazards (or the severity of the accident).
Be sure to understand the meanings of the following terms and comply with the content (instructions) of the instruction manual.

Indications	Meaning
⚠ Danger	Indicates an imminently hazardous situation. Failure to observe the procedures or instructions will result in death or serious injury.
⚠ Warning	Indicates a potentially hazardous situation. Failure to observe the procedures or instructions may result in death or serious injury.
⚠ Caution	Indicates a potentially hazardous situation. Failure to observe the procedures or instructions will result in minor or moderate injury or cause damage to equipment or devices.
Note	Indicates information that is in particular to be noted or emphasized.

1.2 Safety precautions

1.2.1. Precautions for installation

(1) Install the fan considering its weight.
(2) Securely install the fan according to the instruction manual.
(3) Do not install the fan anywhere exposed to high temperatures.
(4) Do not install the fan in a humid place.
(5) Do not install the fan in a location where hazardous or corrosive gases are produced from acids, alkalis, organic solvent, paint or other substances.
(6) Be sure to install a ground fault interrupter to the main power source.
(7) Only qualified personnel such as licensed electrical engineers are allowed to carry out the electrical wiring work. Before carrying out any wiring work, be sure to turn off the main power.
(8) Do not forcibly bend, pull, or pinch any lead wires of the motor.
Otherwise, it may lead to an electric shock.

1.2.2. Precautions for operation

(1) Before starting the fan, ensure that all the relevant workers are informed of the operation and that there are no workers in the dangerous zone.
(2) Only those who are authorized by the site manager are allowed to operate the fan.
(3) Ensure to use the fan at the rated voltage and frequency.
(4) When the fan is running, never touch any parts of the unit unless absolutely necessary.
(5) Do not put your fingers or any rods into the air intake or blowout port.
(6) Do not place any objects around the air intake or blowout port of the fan.
(7) Do not operate the fan when tools or other items are placed on the fan.
(8) Do not operate the fan if there are any defects or faulty parts.

1.2.3. Precautions for maintenance/inspection

(1) Maintenance and inspection must only be carried out by personnel who have been trained to handle the fan.
(2) Before carrying out maintenance or inspection, ensure to all the relevant workers are informed of the operation accordingly.
(3) Before carrying out maintenance or inspection, be sure to stop the fan and turn off the main power. Otherwise, you may suffer an electric shock and/or get injured by an unexpected action of the fan during the work.
(4) If you need to relocate, repair, or modify the fan, ask the vendor or the service center specified by the manufacturer.

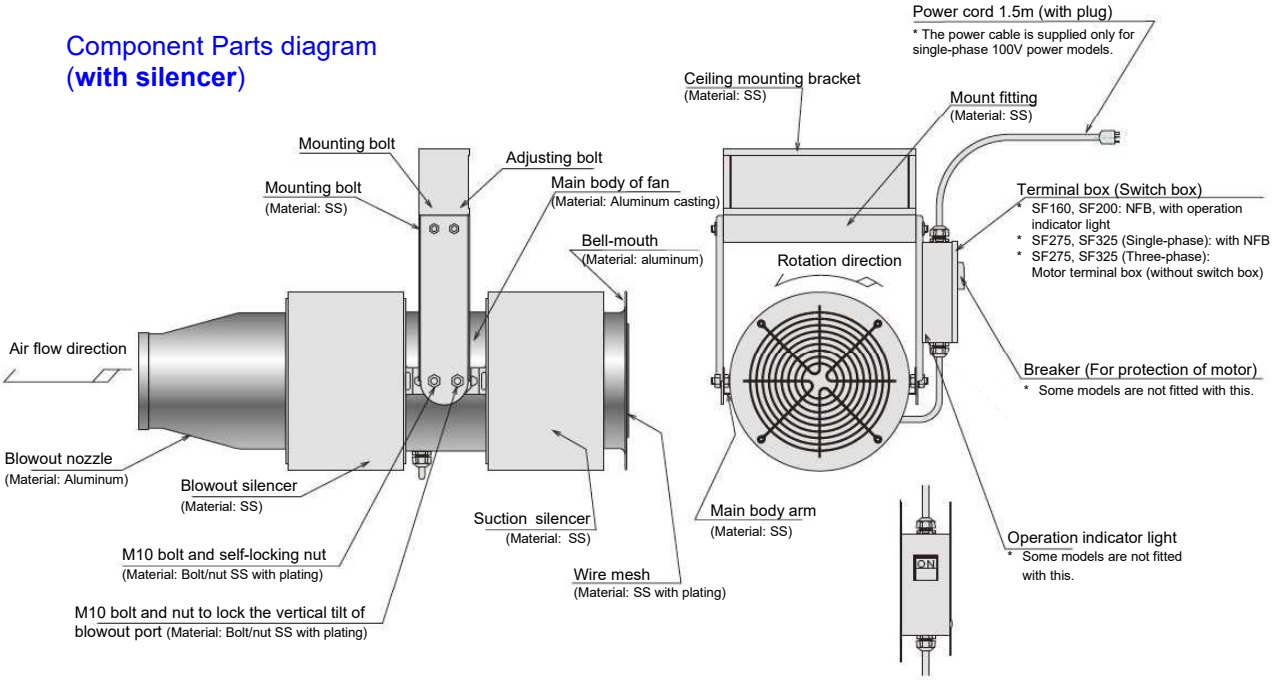
⚠ Warning

Observe all the safety instructions affixed to the machine as well as those described in this instruction manual.

2. Configuration and overview of the fan

2.1 Structure and part names of the fan

Component Parts diagram
(**with silencer**)



2.2 Specifications of the fan

If you have purchased our standard product, refer to the “Standard specifications” table.
Also for a custom-made product with special specifications, refer to the specifications including the external dimensions drawing.

> **⚠ Caution**
>
> Do not use the fan under any conditions other than those provided in the specifications. Otherwise, it may lead to an electric shock, a fire, or failures.

Standard specifications	Applicable gas		Air
			Temperature: –10°C to 40°C, Humidity: 90% or less
	Installation location		Indoors (at ambient temperature of up to 50°C)
	Installation method		To be installed on the ceiling
	Motor	Type	Totally-enclosed indoor type
		Phase, Voltage	Single-phase 100V
			Single-phase 200V
			Three-phase 200V
	Paint color		Munsell N7, gloss only for portions made of SS

第1章 Special specifications	第2章 Item	第3章 Remarks
	Fitted with the falling prevention wire	For the SF160 and SF200 models only. Other models come with standard accessories.
	Extension of power cord	For the single-phase 100V power models only.
	Extension of mounting arm	Extendable up to 550 mm for the SF160, SF275, and SF325 models. Extendable up to 650 mm for the SF200 models. However, not applicable for the silencer L type models.
	Designated color painting	All areas made of SS—except for aluminum parts, wires, and terminal box—are painted in their designated colors.
	Salt resistant / moisture resistant painting	The waterproof switch box, wire mesh, bolts, and nuts are switched to those made of SUS.
	Stainless steel type	The waterproof switch box, wire mesh, arms, silencer, bolts, and nuts are switched to those made of SUS.

3. Installation

3.1 Before installing the fan

When you receive the fan, check the following points first.
If there are any problems, contact the vendor from which you purchased the product.

(1) Check the nameplate to verify that the delivered product is exactly what you ordered.
In particular, check that the information on the rated current (single-phase 100V, single-phase 200V, or three-phase 200V) is correct.
(2) Check that no part of the product is damaged during transportation.
(3) Check all the fastening parts including bolts and nuts are securely tightened.

3.2 Precautions for storage

(1) Do not stack the containers of the fan's main unit more than 3 tiers
(2) Store the fan in a well-ventilated dry indoor place; and avoid storing it in a hot or humid place, a place where water may collect on the floor, or a place exposed to the rain or other liquids.
(3) If the storage period exceeds one month, open the container once a month and check that no abnormal condition is observed in the appearance. In addition, remove the wire mesh on the suction side at that time and rotate the fan rotor at least 30 turns by hand. If the fan is stored for a long period, grease inside the bearing runs to one side and does not spread evenly, which may damage the bearing or generate abnormal noise.

3.3 Precautions for the location of installation

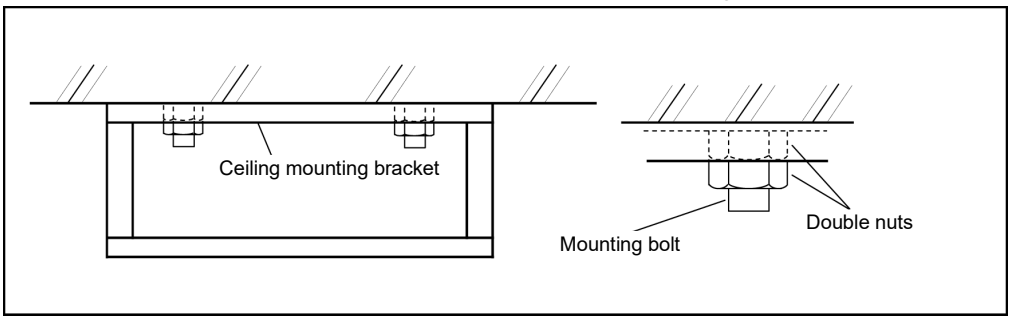
(1) This fan is designed only for indoor use. Install it at a location not exposed to the wind or rain. Ensure that the fan does not suck in any rainwater.
Install the fan in:
(2) a well-ventilated place with minimum exposure to dust and moisture;
(3) a location with an ambient temperature of up to 50°C;
(4) a location free of flammable or corrosive gases;
(5) a location that allows easy and safe work upon maintenance or repairs of the fan; and
(6) for vertically installed fans, a place where no foreign matter may fall from above.

3.4 Installation

⚠ Warning

- Ask the vendor to install the fan in consideration of its weight.
- Fix the fan in place using the fitting and anchor bolts strong enough to sustain the load.

(1) To install the fan on the ceiling, first install the fitting strong enough to sustain the weight of the fan.
If the ceiling is made of concrete slab, drive anchor bolts into the slab to prevent the fan from falling.
(2) After checking the orientation of the fan, install the ceiling mounting bracket using the mounting bolts fixed into the mounting surface in advance.
(3) Use the M12 mounting bolts to securely fix the bracket in place.
(4) After the bracket is installed, lock the nuts on the mounting bolts with double nuts or the like.



3.5 Precautions for wiring work

⚠ Warning

- Use high-quality wiring equipment and devices, and carry out wiring work safely and securely according to the technical standards for electrical facilities, as well as the indoor wiring regulations.
- Only qualified personnel such as licensed electrical engineers are allowed to carry out electrical wiring work. Unqualified persons are prohibited by law to carry out wiring work, and it is very dangerous.
- Do not forcibly bend, pull, or pinch the power cable. Otherwise, it may lead to an electric shock.

(1) Be sure to install a ground fault interrupter on the primary power side of the fan.
(2) For a single-phase 100 V power model, install—within the reach of the supplied power cord (1.5 m)—a power outlet that is compatible with the power plug, and do the wiring work for the outlet. For the other models, connect the power cord to the primary side terminals in the terminal box.

⚠ Caution

Do not run a three-phase power model with only two power wires connected. Otherwise, it may cause the motor to burn out.

(3) Be sure to connect a ground wire to prevent an electric shock.
Do not connect the ground wire to the ground wire of a gas pipe, water pipe, lightening rod, or telephone line.

⚠ Warning

It is prohibited by law to perform incomplete grounding work, which exposes personnel to a great danger.

(4) Control the fluctuation of the voltage within ±10% of the rated voltage, and the frequency within ±5% of the rated frequency. Keep in mind that if you use the fan at a voltage or frequency out of the range, the fan may break down.

4. Preparation for operation

4.1 Check items related to the electrical system

(1) Check if the fan is correctly wired.
(2) Check if the terminals are securely connected.
(3) Check if the fan is securely grounded.

⚠ Warning

Always turn off the main power before changing the wiring of the fan.
Otherwise, it may lead to an electric shock.

4.2 Check items related to the fan

(1) Check that no foreign objects or materials such as tools have been left inside the fan.
(2) Check that the mounting bolts, connecting bolts, and up/down adjusting bolts are securely tightened.
(3) Post an operator in advance so that the fan can be turned off immediately at the supervisor's instruction.

⚠ Warning

Do not operate the fan if you notice any abnormal condition such as noise. Be sure to contact the vendor or the service provider specified by the manufacturer.

5. Operation

5.1 Precautions for starting the fan

(1) If your fan is fitted with the breaker, turn off the breaker before turning on the main power.
(2) Turn on and off the breaker or the power switch once or twice to check the direction of rotation and also to check for any operational problems such as abnormal noise or vibrations. The correct direction of rotation is counter-clockwise when viewed from the suction side of the fan.
For models fitted with the operation indicator light, also check that the operation indicator light comes on.
(3) Start continuous operation, and check for any abnormal vibrations or noise at each section of the fan.

5.2 Adjustment of the blowout direction

⚠ Warning

- Be sure to turn off the breaker before starting the adjustment.
  If you make an adjustment with the breaker turned on, the direction of the fan may suddenly change and it is dangerous.
- When you make an adjustment of the blowout direction, loosen each bolt only to the minimum extent required for changing the direction of the fan. Loosening the bolts too much may cause the fan to fall down.

(1) Horizontal direction
The fan is horizontally 360 degree direction adjustable.
To adjust the direction, loosen the bolt on the pivot side of horizontal rotation and then loosen the adjusting bolt.
Tighten both bolts after the adjustment is completed. Be aware that the pivot-side bolt uses a locknut and therefore requires slightly higher torque for tightening.

(2) Vertical direction
For the SF160 and SF200 models, the fan direction is vertically adjustable from the horizontal level to downward 90 degrees.
For the SF275 and SF325 models, the fan direction is vertically adjustable from the horizontal level to upward/downward 30 degrees.
To adjust the direction, loosen the bolt on the pivot side of vertical rotation and then loosen the adjusting bolt.
Loosening the bolts too much may cause the fan to tilt suddenly.
Tighten both bolts after the adjustment is completed. Be aware that the pivot-side bolt uses a locknut and therefore requires slightly higher torque for tightening.

(3) After the blowout direction is set, check the tightness of each bolt and then start the operation.

5.3 Precautions during the operation

⚠ Warning

In the event of a power failure, be sure to turn off the main power.
The fan suddenly starts on restoration of the power, which leads to a danger.

(1) Frequent starting and stopping the fan quickly damages it.
As a guide, limit the startup frequency to about six times or less per hour.

5.4 Precautions for long-term shutdown

⚠ Warning

If you leave the fan unused for a long time, be sure to turn off the main power.

(1) Ensure to protect the motor and cable connections against moisture.
(2) Before running the fan after a long period of shutdown, check the inside of the fan for any foreign matter.
(3) If the shutdown period exceeds one month, carry out the test run for about 2 minutes once a month. If the fan is shut down for a long period, grease inside the bearing runs to one side and does not spread evenly, which may damage the bearing or generate abnormal noise.

6. Maintenance and inspection

6.1 Daily inspection

(1) Check each section of the fan for any vibration or noise.
A deviation from the normal status is a sign of a failure. Therefore, immediately perform detailed inspection and maintenance.
For this purpose, it is recommended to keep an operation log.
(2) If strong vibrations occur, stop the operation and check for any loose bolts, any accumulation of dust onto the impeller, or any damage to the bearings.
(3) In addition to vibrations, sound is an important factor in judging the operating condition.
If you hear a metallic sound possibly made by something being in contact with the rotor, immediately stop the operation and investigate the cause.

6.2 Periodic inspection

⚠ Warning

Before carrying out the inspection of the fan, be sure to turn off the main power.
The fan may suddenly start up through automatic operation or from other causes, thus exposing the personnel to great danger.

6.2.1. Monthly inspection

The monthly inspection includes the following check points, in addition to the daily inspection items.
(1) Check the fan's main unit (the main body, silencer, suction port, and blowout nozzle) for any formation of rust.
(2) Check the suction port for any adherence of foreign matter.
(3) Check that the operation indicator light comes on. (Some models are not fitted with the light.)
(4) Even if the fan shows no abnormal condition, it is recommended to clean the inside of the fan and check the electric current value once every 3 months.

6.2.2. Annual inspection

Carry out the annual inspection once a year, starting from the second year.
The annual inspection includes the following check points, in addition to the monthly inspection items.

(1) Check each section for any loose bolts or nuts.
(2) Check the impeller, motor, and others parts for any corrosion.
(3) Clean the inside the fan.
(4) Check that the insulation resistance of the motor has not decreased. The resistance must be at least 1MΩ.
(5) Check the electric current value during the operation.
(6) The bearing of the motor has a service life of about 20,000 hours. Since the life depends on the operation conditions, the bearing must be checked and replaced if any abnormal vibration or noise is generated.
For replacement of the bearing, contact the vendor or the service center specified by the manufacturer.

Annual inspection memo

Inspection date	Results of inspection / Repair log

7. Troubleshooting

7.1 Troubleshooting

The cause of the failure and the corrective measures against it may be different even if the fan exhibits the same symptom. In addition, there may be two or more causes.

If you cannot find the cause or corrective measures in the following table, immediately stop the operation and contact the vendor or the service center specified by the manufacturer.

Symptom of failure / Cause of failure	Insufficient performance	Motor does not run	Excessive noise	Excessive vibration	Corrective measures
Insufficient rotation speed	✓				Check the power voltage
Reverse rotation (for three-phase power models)	✓				Swap two of the power wires
Contact of rotor with stationary part		✓	✓	✓	Disassemble and repair
Contamination with foreign matter		✓	✓	✓	Disassemble and do internal inspection
Faulty bearing (damaged/worn out)			✓	✓	Disassemble and replace the bearing
Improper installation			✓	✓	Check the installation
Failure related to power supply		✓			Inspect and repair
Failure of the motor		✓			Disassemble and repair

⚠ Caution

If you need to replace any parts or repair the fan, ask the vendor or the service center specified by the manufacturer.
Improper work may lead to malfunctions or accidents.

MEMO

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