

# Muto Turbo Blower

KF Series (Standard)

KF-S Series (with Filter silencer)

KF-L Series (Low noise)

## Instruction Manual

Read this manual carefully before using the product.

Wrong operations deviating from this manual may lead to serious accidents or damages.

Keep this manual convenient location for easy access.



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## 1. Introduction

Thank you for purchasing the Muto Turbo Blower KF, KF-S and KF-L Series.

This manual contains the information you need for handling, installing, operating and maintaining your new equipment correctly, to ensure trouble-free operation and long service life. Please read it thoroughly. After reading this manual, keep it in convenient place for easy access.

## 2. Safety precautions

Before starting any work such as handling, installing, operating and maintaining, carefully read this manual and all documents attached to the product for proper use. Use the product after thorough understanding of all product information, safety information and precautions.

In this manual, safety precautions are classified as "Warning" and "Caution".



This tag indicates that wrong operation or use may lead to fatal loss or serious injury.



This tag indicates that wrong operation or use may lead to human injury or loss of property.

Even the items under  **Caution** may lead to serious results depending on the circumstances.

Those precautions include very important information and it is strongly recommended to follow them strictly.

### **Warning**

( Place to install )

- The product with non-explosion proof type motor shall not be installed in explosive or inflammable atmospheres. Otherwise injuries, explosions or fires may occur.

( Gas )

- Unless otherwise agreed separately, the product can handle only normal air. It is cannot be handled any other gas (explosive, toxic, corrosive, high temperature and so on), liquid or solid materials. Otherwise injuries, explosions or fires may occur.

( Wiring )

- Refer to the instruction manual of motor. Otherwise fires, electrical shocks or explosions may occur.
- Do not touch the wiring. Shut off the power before checking the wiring. Otherwise electrical shocks may occur.

( Operation )

- Do not get close to or look into the open inlet or outlet manifold during the product is running as it is very dangerous as follows.  
Inlet ; Clothing which you are wearing or a part of your body will be sucked in. As a result, injuries may occur.  
Outlet : A strong wind or flown things may cause injuries.

## Warning

- Do not insert finger(s) or hand(s) into the opening of the safety covers such as external fan cover and cooling fan cover. Do not remove the safety cover during the product is running. Otherwise injuries may occur.
- Shut off the main power switch in case of power failure. Otherwise injuries may occur.

### ( Disassembly and Reassembly )

- Before disassembly and reassembly, make sure to shut off the main power and prevent power to be turned on. Otherwise injuries or electrical shocks may occur.

### ( Others )

- Follow the labels attached to the product. Otherwise serious results may occur.

## Caution

### ( Transportation )

- Check the mass of the product with the specifications, drawing or catalogue before transportation, and be careful not to drop or tip over the product during transportation. Otherwise injuries or breakages may occur.

### ( Installation )

- Remove all of the inflammable from the product and its vicinity. Otherwise fires may occur.
- Ventilate the room to keep the ambient temperature below 40 deg. C. Otherwise burns, fires or bearing-damage may occur.

### ( Operation )

- If any abnormalities are found, stop the machine immediately. Otherwise injuries, electrical shocks or burns may occur.
- Check rotational direction of the motor before operating. Otherwise breakages may occur.

### ( Disassembly and Reassembly )

- Disassembly and reassembly should be done by experts. Otherwise injuries or breakages may occur.
- Do not use the parts of this product for the other equipment. Do not use unauthorized parts for the product. Otherwise injuries or breakages may occur.

### 3. Receiving Checkups

Check if the products you have received are what have been ordered by referring to the order sheet, drawings, invoices, etc.

- (1) Check the nameplates on the blower and the motor, and confirm if it matches what have been ordered.
- (2) Count the number of the product, and confirm if it agrees with what have been ordered.
- (3) Confirm that there is no breakage during transportation.

### 4. Transportation and Handling

When transporting the blower, be careful not to give shocks to any parts of the blower.

### 5. Storage

If the blower is stored before installation, be careful as follows:

- (1) Store the blower in a room where ventilated, not humid nor dusty. Otherwise the blower may have any troubles.
- (2) Before operating the blower which had been stored for long period of time, check if the bearing and the insulation of the motor have no problem.
- (3) While the blower is stored, rotate the blower shaft several times by hand every month. If this procedure is not performed, the life of the bearing may become short.
- (4) After stored for long period of time, carefully check if the blower has no abnormality before operating.

### 6. Installation

The blower should be placed on a flat and rigid foundation with vibration isolator pads. If there are gaps between the pad and foundation, fill the gaps with thin steel sheets (shimming).

Clear some space to maintain the blower.

When anchor bolts are used, do not fasten nuts tightly so that the pads will be effective. (Fig.1)

(Anchor bolt is option.)

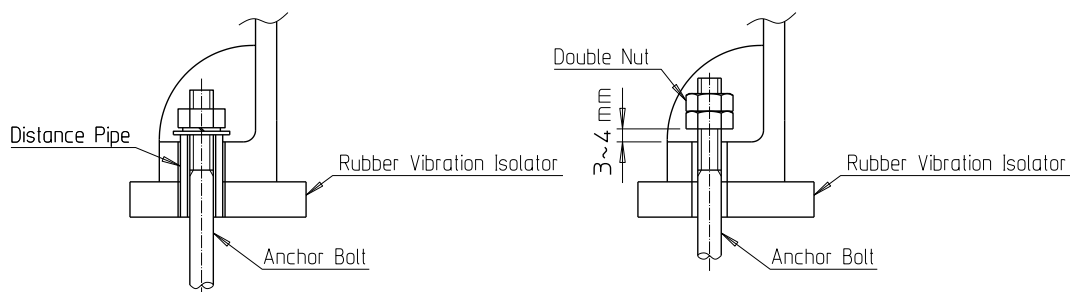


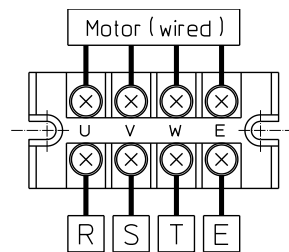
Fig.1 Anchor bolt

## 7. Piping

Use the sleeve joint to connect the outlet of the blower with a pipe to avoid unnecessary force to the blower and to isolate the vibration from the blower. If direct connection to the pipe is inevitable, do not give the force to the blower by dimensional tolerances, weight of piping, thermal expansion of piping, etc. When piping to connect, keep 25mm between the outlet and the pipe so that the joint will be effective.

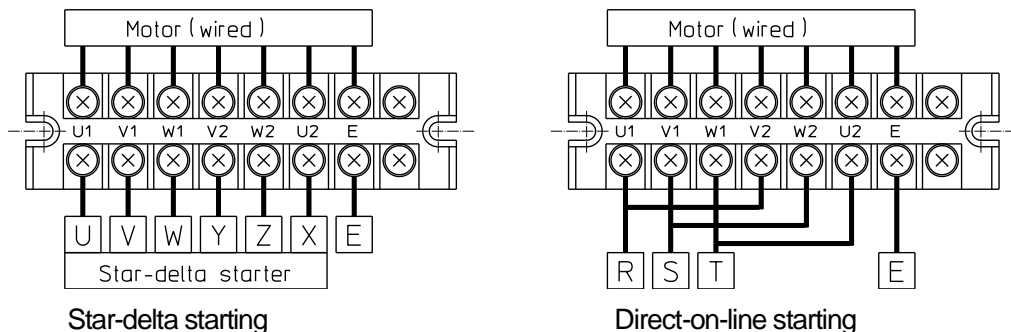
## 8. Connection to Power and Test run

- (1) Turn the motor shaft by hand to verify free rotation without rubbing or noise.
- (2) Check the nameplates of blower and motor and confirm if they agree with the specification for power supply, then connect to power line under instruction by electrical engineer as per electric technical standards and wiring regulation. For KF-L series only, refer to Fig.2 or Fig.3.



Direct-on-line starting

Fig.2 Terminal block (for 3.7kW or smaller)



Star-delta starting

Direct-on-line starting

Fig.3 Terminal block (for 5.5kW or larger)

- (3) Jog the blower and confirm the rotational direction is the same as the mark. If the rotational direction is opposite, change the wiring connection. The direction can be reversed by exchanging 2 wires of 3 wires. If the blower is run continuously with reverse rotational direction, it cannot perform as specified and may lead to serious accident.
- (4) Shut the damper.
- (5) Run the blower, and open the damper as air volume becomes the required amount. Measure the electric current (average of each of 3 phases) of the motor. If it exceeds the rated current, use at below the rated current by adjusting the air volume with damper and so on. After running for a while, if there is no abnormal vibration or noise, test run can be concluded. If any abnormality were found during test run, corrective action should be taken by referring to "11. Troubleshooting".

## 9. Precautions for Operation

Before operating the blower, understand the following thoroughly.

- (1) Air volume is adjusted by the damper. After adjusting the volume with the handle, its position can be fixed by the wing screw. (Fig.4)

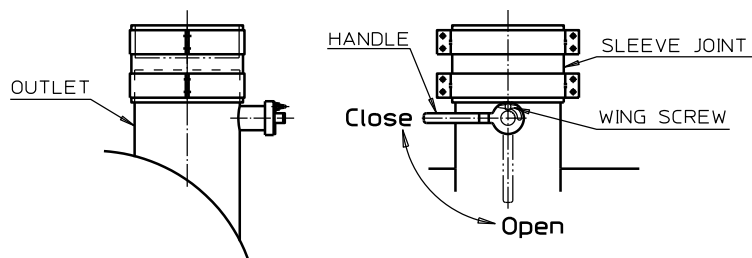


Fig.4 Damper

- (2) Continuous use at small air volume will lead to blower durability problem.
- (3) The blower is designed to handle clean air. It cannot handle for air containing particulates and dust, corrosive gases nor inflammable gases. Temperatures of air which standard model can handle are in the range of -15 to 40 deg. C.
- (4) To start the blower as shut the damper is recommended. But open the damper immediately after the blower run.
- (5) KFL Series has the minimum volume. Do not run the blower below the minimum volume. Because the motor may break down so that it is not cool enough. Each of the minimum volumes is shown on Table 1.

Table 1 Minimum volume

Model	volume [ m <sup>3</sup> /min ]	Model	volume [ m <sup>3</sup> /min ]
KF-3PL	1	KF-3L	1.15
KF-5PL	1.3	KF-5L	2.7
KF-7PL	1.9	KF-7L	2.8
KF-10PL	3.15	KF-10L	2.85
KF-15PL	4.3	KF-15L	3.65
KF-20PL	5		

## 10. Maintenance

The following maintenance is recommended to keep the blower in good condition.

- (1) Pay attention to ventilation to keep the ambient temperature in the range of -15 to 40 deg. C.
- (2) Pay attention to abnormal noise, abnormal vibration, abnormal temperature and air leakage. If abnormality is found, take actions referring to "11. Troubleshooting".
- (3) The only bearings in the blower are in the motor, which are lubrication-free type.

(4) Check the cleanliness of the filter periodically. Replace or clean the filter if and when the air filter is not clean, as it causes pressure loss.

( i ) KF and KF-L series (Fig.5)

(a) Removal

The filter (Round shape) can be pulled out. The filter (Belt-like) can be removed after taking off the Velcro. Do not scrap the Velcro to be reused.

(b) Setting

Push the filter into, and fix the filter (Belt-like) with the Velcro.

Note: The filter should not have wrinkle and gap.

(c) Cleaning

The filter can be washed by soaking into water or neutral detergents. (Wash it gently, do not rub or do not squeeze it.) Lay the cleaner side up to dry. It can be cleaned for several times with this method.

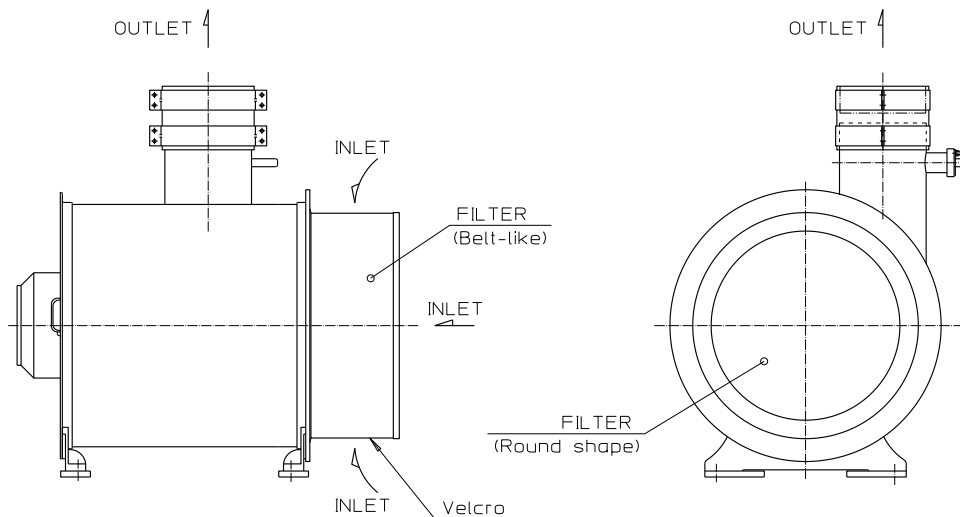


Fig.5 KF series (Filter parts of KF-L series are the same as KF's.)

( ii ) KF-S series (Fig.6)

(a) Removal

Remove the wing screw, and remove the cap and the outside expanded metal. And remove the filter.

(b) Setting

Basically do the reversed orders of (a).

Note: The filter should not have wrinkle and gap.

(c) Cleaning

The filter can be washed by soaking into water or neutral detergents. (Wash it gently, do not rub or do not squeeze it.) Lay the cleaner side up to dry. It can be cleaned for several times with this method.

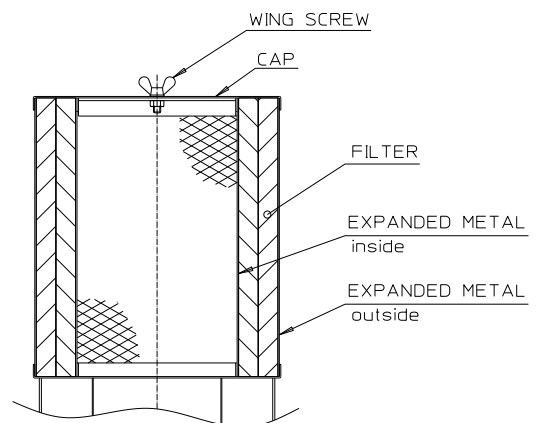


Fig.6 Filter silencer (only cross sectional drawing of filter part)



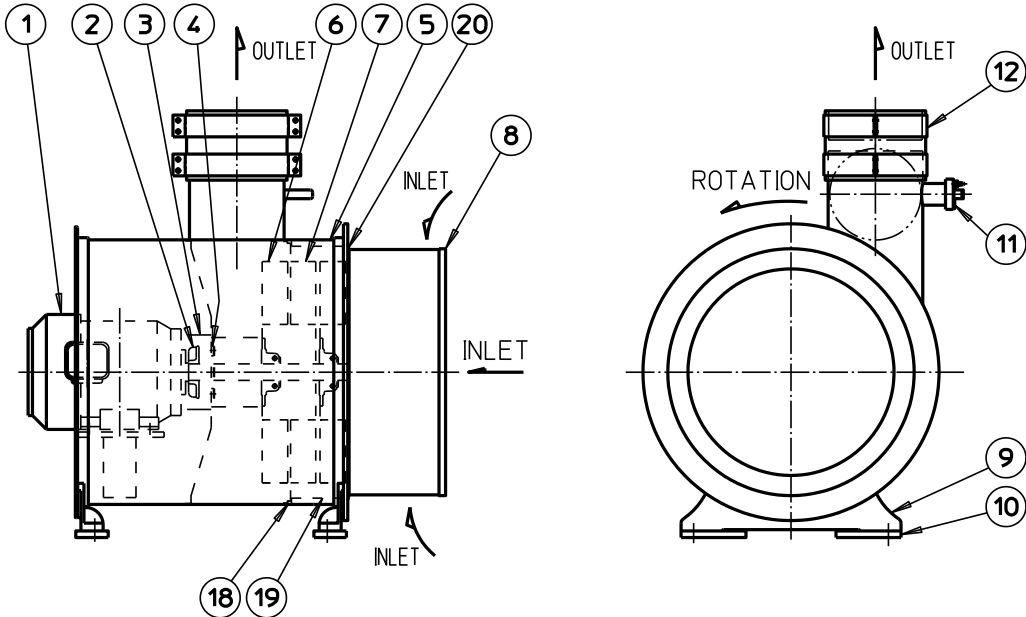
## 11. Troubleshooting

The following table is for troubleshooting during test run and operation.

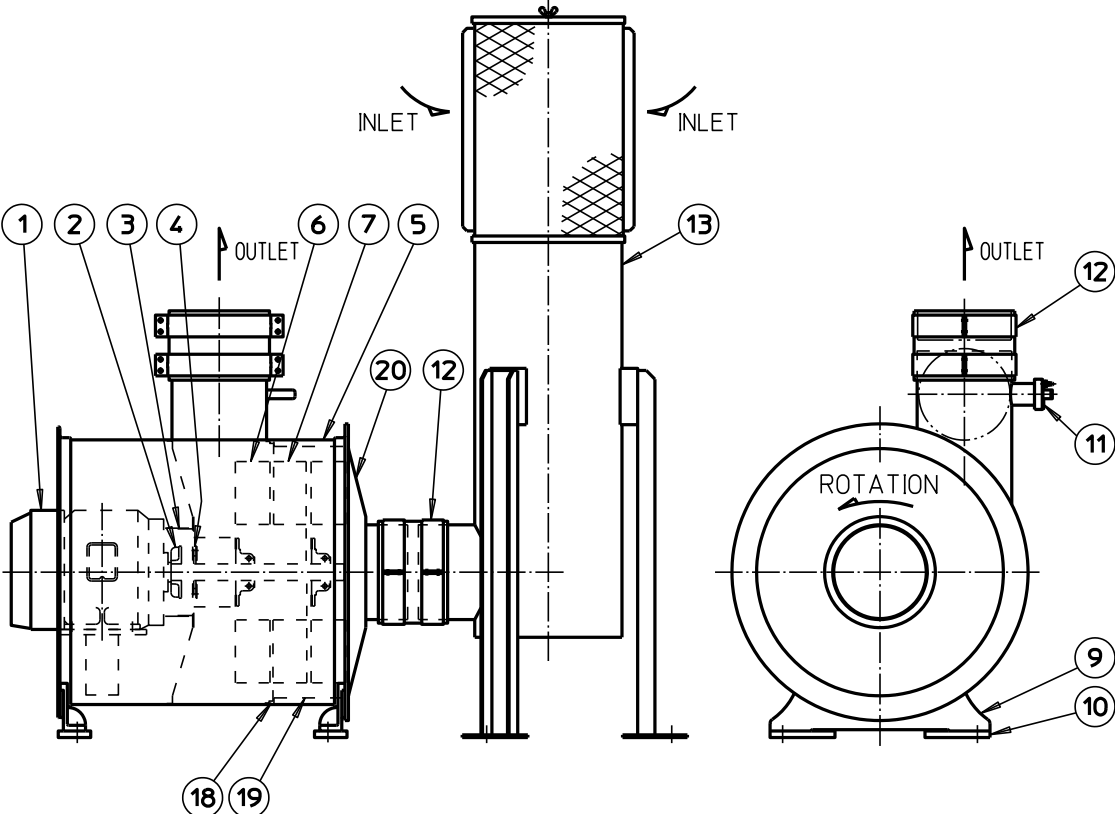
Trouble	Cause	What to do
Blown fuse or Tripped circuit breaker	Abnormal voltage or frequency	Consult with power company.
	Inappropriate capacity of power source equipment	Replace with appropriate one.
	Missing phase	Check wiring.
	Imbalanced voltage of phase	Consult with power company.
	Excessive voltage drop	Check the thickness and length of wiring.
	Excessive current	Reduce air volume by dumper.
	Reversed rotation	Change wiring. ( exchanging 2 wires of 3 wires)
	Fan touch	Repair.
	Water in the casing	Drain and take some preventive measure.
	Abnormality of bearing	Repair.
Insufficient air pressure or volume	Improper frequency	Consult with Muto.
	Too high ambient air temp.	Improve air ventilation of the room.
	Leakage or clogged piping	Check piping.
	Missing phase	Check wiring.
	Damaged fan, deflector, etc.	Repair.
	Reversed rotation	Change wiring. ( exchanging 2 wires of 3 wires)
	Dirty or clogging air filter	Clean or replace.
	Lowered motor speed	Consult with Muto.
	Foreign material on the fan, deflector, etc.	Clean up.
Abnormal noise and/or vibration	Touching or broken fan	Repair.
	Reversed rotation	Change wiring. ( exchanging 2 wires of 3 wires)
	Imbalance of fan	Fan cleaning. If vibration still remains, repair it.
	Bad bearing	Repair.
	Foreign object or water	Clean up and protect.
	Imbalanced voltage between phase	Consult with power company.
	Missing phase	Check wiring.
	Air leakage	Check piping and repair.
Weight of piping or force induced by thermal expansion	Get rid of any force to the blower.	

**12. Structural drawing**

KF series

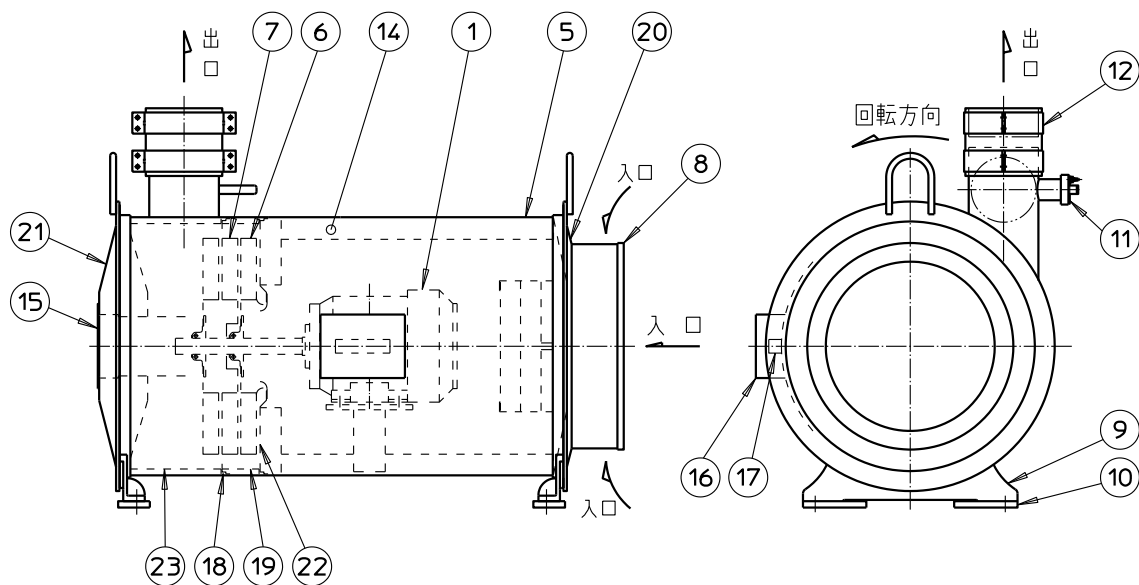


KF-S series



Note: Filter silencer of side view is omitted.

KF-L series



No.	Description	Qty.		
		KF	KF-S	KF-L
1	Motor	1	1	1
2	Cooling fan	1	1	-
3	Cooling fan cover	1	1	-
4	Shaft seal	1	1	-
5	Casing	1	1	1
6	Fan	2	2	2
7	Deflector	1	1	1
8	Air filter	1	-	1
9	Foot	2	2	2
10	Rubber vibration isolator	4	4	4
11	Damper	1	1	1
12	Sleeve joint	1	2	1
13	Filter silencer	-	1	-
14	Absorbent	-	-	1
15	Rotation check hole cover	-	-	1
16	Pull box	-	-	1
17	Terminal block	-	-	1
18	Rope packing	1	1	2
19	Spacer	1	1	1
20	End head (A)	1	1	1
21	End head (B)	-	-	1
22	Half deflector	-	-	1
23	Outlet ring	-	-	1

### **13. Motor**

Regarding motor, refer to the instruction manual of the motor.

### **14. Inquiry**

If you need to contact us regarding this product, please kindly inform us the information on the nameplate such as CAT. No. , PROD. No. , DATE. In case of troubles, inform us the broken portion, running time (days) and condition used and others additionally.

### **15. Limited Warranty**

The warranty period of this product is one year from the day of shipment unless otherwise specially agreed. Within the period, the malfunctions induced by defects of material or technical reasons will be repaired free of charge. But under following situation, this warranty will not apply to any products.

- (1) Malfunctions that occur past the warranty period
- (2) Malfunctions that occur due to inappropriate usage
- (3) Malfunctions or breakage due to inevitable event such as fire, severe weather, earthquake or such
- (4) By except us, the product has been repaired or modified.

We shall not be responsible for any incidental or consequential damages.

This warranty is valid only for the product used within Japan.

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## ***Muto Products***

- Muto Wide Blower
- Muto Turbo Blower
- Muto Spencer Blower (Under technical license)
- Muto KF Blower
- Muto Scroll Blower
- Muto Central Vacuum System