

Operation Manual for

CFM-H-series

Pulsejet Dust Collectors



 **Showa Denki**

Introduction

Thank you for buying a Dustrésa dust collector in our CFM-H series.

Showa Denki, as a dedicated manufacturer of blowers and dust collectors, has supplied innovative products developed by making the best use of its flow and rotary machine expertise. Compact, yet featuring high performance and low energy consumption, your Dustrésa will serve you for long safe and sound as long as you follow the instructions in this manual.

It is recommended that you keep the manual on hand for quick reference.

This operation manual provides all necessary information ranging from installation to maintenance about the following dust collectors:

CFM-H10



CFM-H20

CFM-H30

CFM-H40

Symbols used herein

The symbols and headwords found in this manual respectively have the following meaning:

 Warning	If failed to observe the relevant instructions, it could cause death or serious injury.
 Caution	If failed to observe the relevant instructions, it could cause injury or property damage.



indicates what must not be done.



indicates what requires the use of good care.



indicates what must be done.

Contents

Page

Chapter 1	Cautions for safety	- 1 -
Chapter 2	Outline of the dust collector	- 3 -
	Configuration	- 3 -
	Components	- 4 -
Chapter 3	Installation	- 5 -
	Installation	- 6 -
	Electrical wiring	- 6 -
	Air piping	- 7 -
	Hood and connection of the duct	- 7 -
	Trial operation	- 7 -
Chapter 4	Operation	- 8 -
	Routine operation	- 8 -
	Caution	- 8 -
	Differential pressure indication	- 9 -
	Pulse setting	- 10 -
Chapter 5	Maintenance	- 11 -
	What and when to inspect	- 11 -
	Maintaining the FR unit	- 11 -
	Replacing the filter cloth	- 12 -
	Troubleshooting	- 13 -
	Specifications	- 14 -
	Internal wiring diagram	- 15 -
	Outside dimensions	- 15 -
Chapter 6	Warranty	- 16 -

Warning



Any Dustrésa must not suck the following things:

- **A lit cigarette or match, hot dust**

- **Sander or grinder sparks**

The filter cloth of the dust collector is flammable. The filter cloth may be ignited by a spark, causing a fire.

If a fire occurs in the dust collector, immediately turn the switch off and supply fire extinguishing agents, which are suitable for the dust particles to be suctioned, to the intake port. After that, block both the intake port and exhaust port. Do not open the front door until the temperature inside the dust collector lowers.

- **Flammable gases from petrol, thinner, etc.**

Sparks from the incorporated electric components, static and contact of metals can cause an explosion.



Do not operate the Dustrésa with its maintenance door opened because it could be closed by negative pressure inside catching your fingers and/or the motor overloaded.



Do not ride on the Dustrésa because it could be deformed or you could fall.



The wooden pallets and wooden frames used for shipping the product use nails.

When unpacking the wooden packing materials, immediately remove the nails. Protruding nails may cause personal injury.



Before performing the maintenance and inspection work, be sure to turn the power off, lock the circuit breaker or power distribution panel, and post a sign stating that an inspection is underway. Take appropriate measures so that a third person does not turn the power on accidentally. (Ordinance on Industrial Safety and Health, Article 107)

This dust collector cannot suction metal powder particles such as aluminum, magnesium or titanium dust; grain powder particles such as flour or starch dust; flammable powder dust particles such as wood flour, resin powder particles or carbon dust; or flammable gases. A powder dust explosion due to static electricity may occur inside the dust collector. When handling these powder dust particles, be sure to use a dust explosion proof model.

The design service life of this product is eight years except excluding its consumable parts. When the product is used for an extended period of time exceeding the design service life, the risk of failure or malfunction increases.

Caution



The Dustrésa should not suck the following things which can cause it a failure:

- **Hot gas**

The gas heated to 40°C or more would deteriorate the insulation of electric components inside the dust collector.

- **Water, oil, adhesives and adhesive dust**

They would adhere to the filter cloth causing it blinding.

- **Work, tools and other solid objects than dust**

They could damage the ducts and filter cloth.

- **Particulates** (5 μ or smaller) of carbon and other materials

Use a high-performance filter cloth as the standard type can allow leaks.

- **Lightweight dust** including feather, cotton dust, polystyrene foam dust

They would adhere to the inside of the dust collector.

- **Highly abrasive powder dust particles** such as glass powder particles or polishing agents

Holes may be opened in the filter cloth by abrasion, causing powder dust particles to leak. Furthermore, holes may also be opened in the duct or main unit.



Do not apply high pressure on the Dustrésa with a pressurizer.



Do not directly connect an inverter to the machine; otherwise, other internal circuits for the pulse control than that of the motor could be damaged.



Handle powder dust particles collected by the dust collector correctly according to the national or local governmental regulations in the same manner as disposal parts such as old filter cloths to which powder dust particles are adhered, except when reusing them.

In addition, when disposing of a dust collector that is no longer used, remove powder dust particles adhered to the main unit and recycle the unit as metal waste. Handle other parts to which powder dust particles are adhered according to the relevant laws.



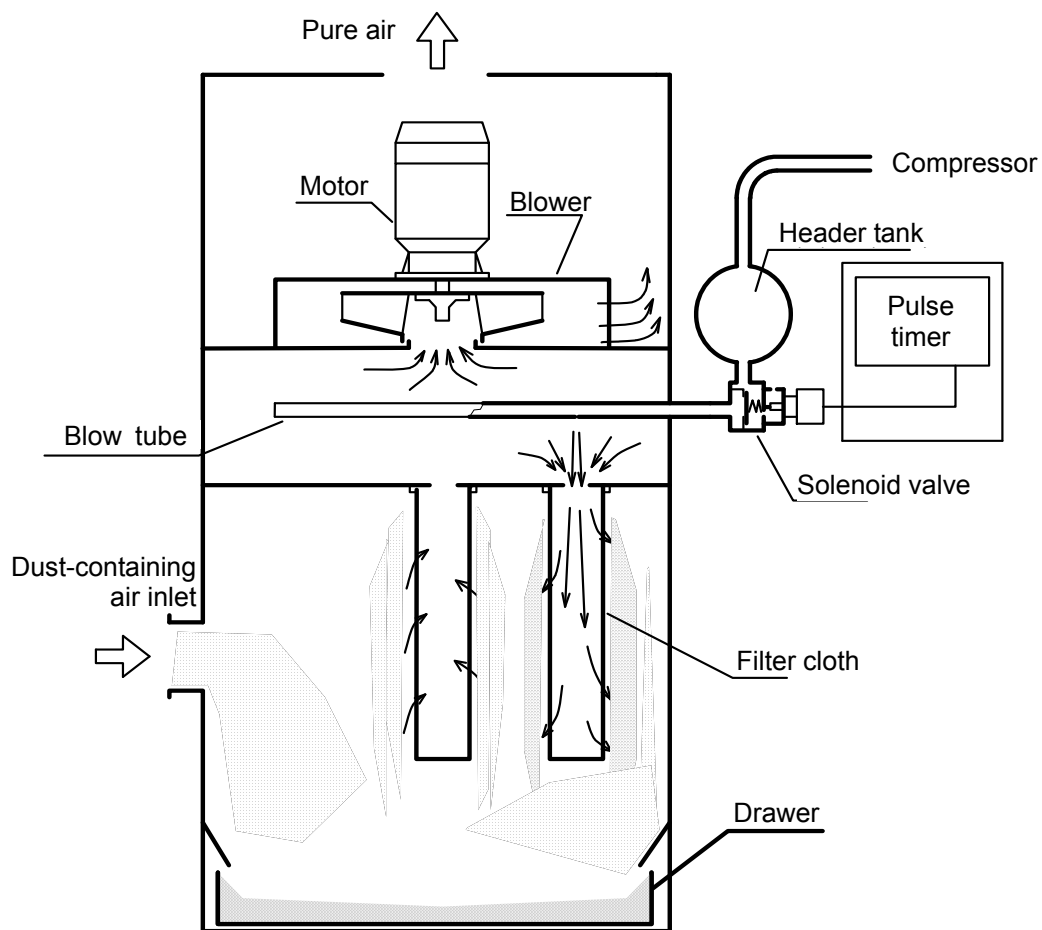
Before performing the maintenance and inspection of pneumatic units such as the FR unit, be sure to release the residual pressure inside the main unit. To release the residual pressure, stop the air supply and loosen the drain valve on the FR unit to exhaust the air from inside the main unit.

This dust collector operates based on the assumption that the particle diameter of the target dust is 5 μ m or more with the standard filter cloth and 1 μ m or more with the optional high performance filter cloth. The dust amount is 1 g or less for an air volume of 1 m³/min. If the dust collector suctions powder dust particles exceeding this range, dust leakage, increase in filter cloth pressure loss, or clogging may occur.

Chapter 2 Outline of the dust collector

Configuration

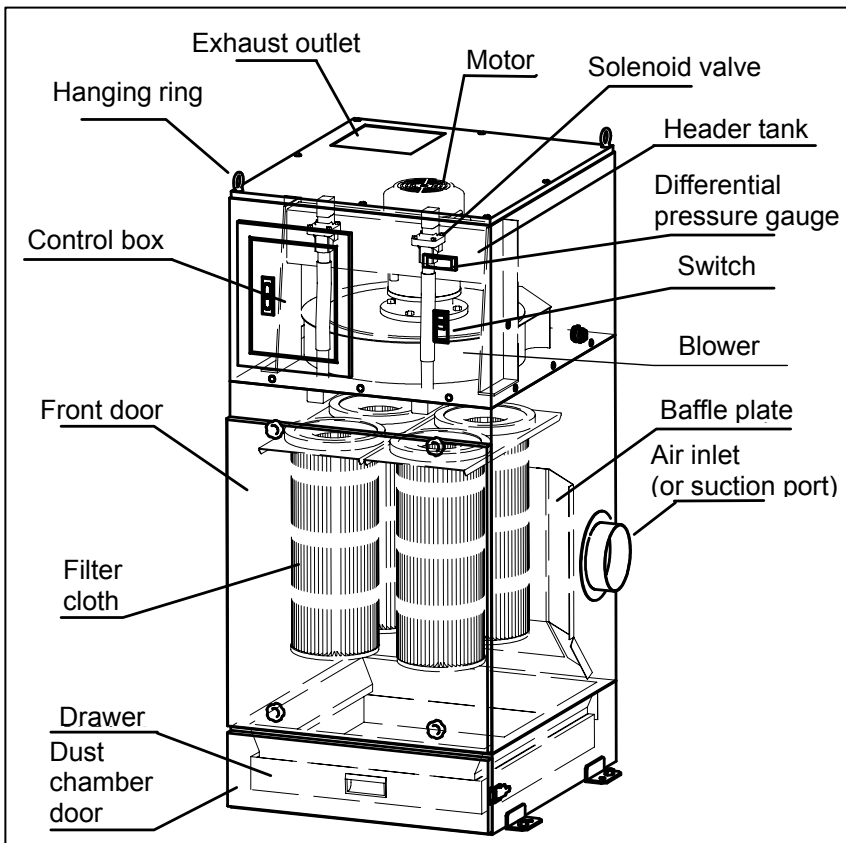
The dust-containing air sucked from the inlet, primarily separated into dust and air, are sent to the filter cloth. The air is filtrated by the outer surface of filter cloth and exhausted via blower into the atmosphere as pure air. The dust deposited on the outer surface of filter cloth is shaken off by back-washing power produced by compressed air, which is momentarily blown from the blow tube mounted on the upper part of the perforated plate, against the inner surface of filter cloth. Each filter cloth in each filter line is thus cleaned automatically. The shaken-off dust, together with the primarily separated dust, is collected in the drawer.



Note: The above sketch is only for operational information which differs from the product's configuration.

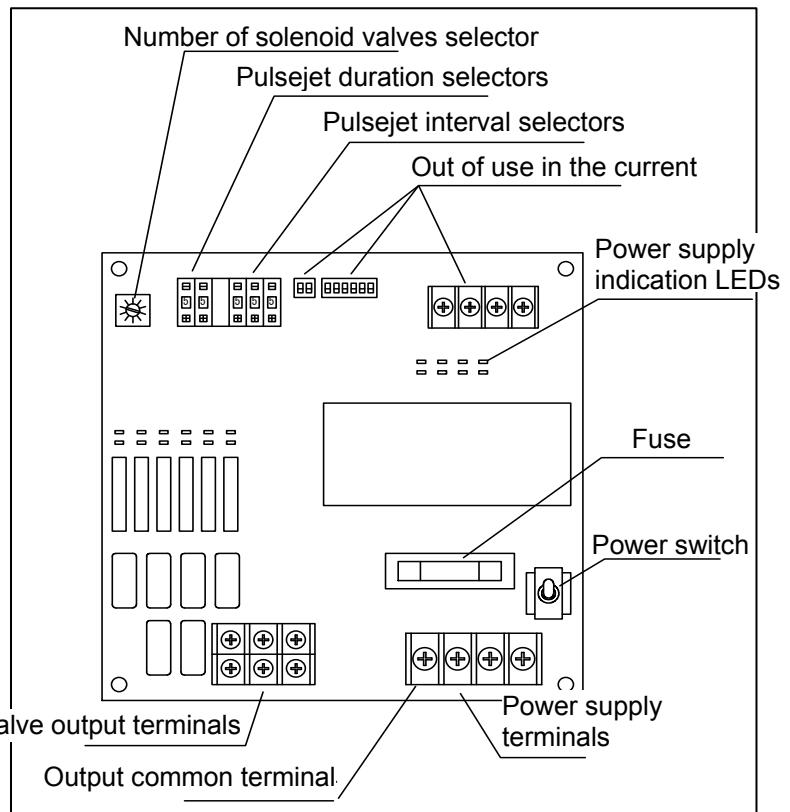
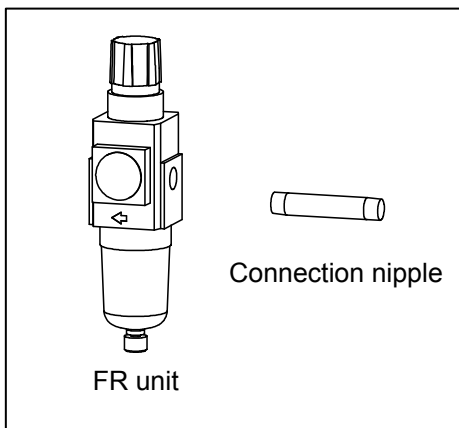
Components

Pulse controller in detail



Accessories

(Inside of the control box)



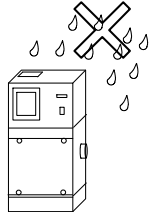
Chapter 3 Installation

Upon receiving the product, please examine its nameplate to see if the type, voltage and frequency indicated on it conform with those of the ordered product. Also, check up the accessories for conformity. In case of any damage to the product or a shortage of parts caused during transportation, please immediately contact the relevant retailer or a nearby branch or sales office of Showa Denki.



Install the dust collector in a place fulfilling the following conditions:

Indoor places not get wet by rainwater



CFM-H dust collectors are specific for indoor use. For installation, avoid places liable to get wet that may induce an electric shock and a product failure.

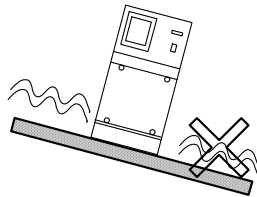
No dew condensation at room temperature

Ambient temperature: 5°C to 40°C

Humidity: not higher than 80%

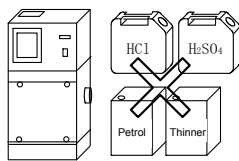
High temperatures and dew condensation could cause an electric component failure and/or an electric shock. At low temperatures, the compressed-air drain solenoid valve could be frozen.

Horizontal places free from vibrations



Unusual vibrations could cause the product to topple over.

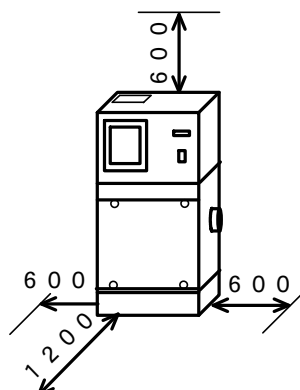
No hazardous chemicals stored around



Places close to stored petrol, thinner, and other flammable chemicals have the possibility of an explosion and/or a fire.

Places near the chemicals, like hydrochloric acid and sulphuric acid, that produce a corrosive gas could cause the product to corrode.

Places easy for maintenance



Unit: mm

Spaces as illustrated on the left must be secured for dust discharge, filter cloth replacement and purified-air release.

Installation



- When moving the machine body, use its hanging (ring) bolts and handle the body very carefully without giving it impact. Never hang the body at one point. This work should be undertaken only by qualified persons.

(The CFM-H40 machine must be hung by 4 points.)

- As its installation, the machine should be fixed on a concrete floor with anchor bolts. Use liner to regulate any gap between the machine and the floor. Use the base plate nut for leveling work.



- Keep enough room above the exhaust outlet of the machine's roof so the machine may display its normal suction power at all times. Put nothing on the outlet.

Electrical wiring



- Only qualified persons should work on the electrical wiring of the dust collector pursuant to the Electrical Equipment Technical Standards and the Internal Wiring Regulations.
- Make sure of the machine's power supply as per its nameplate and use what is specified therein. Operating the machine on a different power supply could be very dangerous causing an operation failure.
- The breaker and earth leakage breaker of the power supply should be compatible with the start-up current value.
- Be sure to earth the power supply connection.

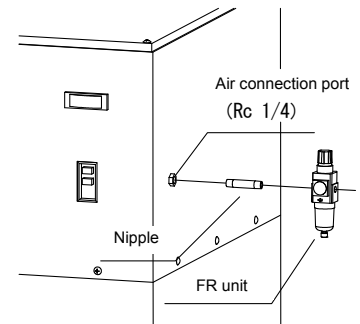
Model	200V 50Hz	200V 60Hz	220V 60Hz
CFM-H20	6.1A	6.1A	5.6A
CFM-H30	8.5A	8.1A	7.5A
CFM-H40	15.1A	13.7A	12.9A
CFM-H40	22.6A	21.0A	20.0A

Air piping

- Attach the accessory nipple and FR unit to the air connection port on the machine's flank for the connection of compressed air. Since the FR unit has a specified airflow direction as indicated with an arrow mark which should be followed when installing the unit.
- The air connection port, which is factory-set on the right flank of the machine, can be changed to be set on its left flank by changing the internal configuration. Location of the FR unit pressure gauge may also be changed from the back to the front of the machine.



- Compressed air must be free from an oil and water mixture. Oil and water deposited on the filter cloth will blind it.
- Set the air pressure for 0.5 to 0.7 MPa by operating the handle on the upper part of the FR unit; lift up and turn it to change the settings and push it back when done.



Note: 0.1 MPa = 1 kg/cm²

- Choose a desired compressor capacity and piping diameter by referring to the air consumptions in the following table:

CFM-H10	CFM-H20	CFM-H30	CFM-H40
40 L/min	50 L/min	60 L/min	80 L/min

Note: The listed air consumptions are based on the conversion into atmospheric pressures on the assumption that pulsation is activated twice per minute at 0.6 MPa.

Hood and connection of the duct

- Dust collection method and suction air speed (controlled air speed) may vary depending on the kind of dust and the condition of scattered dust. Generally, the suction air speed in the hood opening vicinity should be designed to be 0.5 m/sec. or faster. Also, it is desirable that the airflow in the duct is 15 m/sec. or higher.
- The duct piping should be air-tight with no suction or leakage through the joints.
- Use supports and expansion joints to prevent any direct duct load from being applied on the machine.
- In case a flexible duct is used, it should not be bent too sharp or unnecessarily sagged so it may keep a high suction power.
- The suction port, factory-set on the right flank of the machine, can be changed to be set on its left flank. Interchange the suction cover and the suction port.
- Although no exhaust duct is required in most cases, install the duct where necessary.
- In case a duct is to be installed on the exhaust outlet, make it as short as possible. This is because, with a large load applied on the exhaust side, not only the suction power is weakened but also air leaks could occur in the switch section or other portions. Also, caulk the place around the ceiling panels to prevent air leakage.
- Design the exhaust duct so it may be readily detached for maintenance.



For detailed information about the choosing of hoods and ducts, please call our nearby branch/sales office.

Trial operation

- Before a trial run of the dust collector, make sure:
 - that the installed machine has no backlash or play;
 - that the power supply cable, earth cable, insulation and voltage have been arranged as specified;
 - that no leak occurs at the air joints or no bolts, tools, etc. are left behind in the duct;
 - that the maintenance door is securely closed;



- With the above points confirmed, turn on the power switch and turn it off quick and observe the rotation direction. To monitor the motor shaft, detach the grommet in the centre of the ceiling panels.
If it turns clockwise, it is alright. If it turns counter-clockwise, then turn off the power supply and change the connections of 2 cables of the 3 power supply cables.
- Check up the machine to see if it produces no vibrations or unusual noise during operation or no air leaks at the duct joints.
- Make sure that pulsation is activated upon machine operation start.

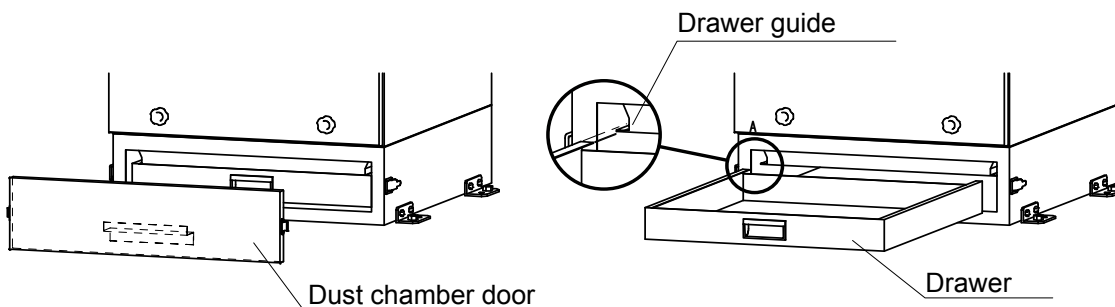
Chapter 4 Operation

Routine operation

- Operation procedures:
- [1] Make sure that the compressed air pressure is somewhere between 0.5 and 0.7 MPa.
 - [2] Also make sure that the maintenance door is closed.
 - [3] Close the damper, if any.
 - [4] Start operating the machine by turning on the switch.
 - [5] Open the damper.
- End operation procedures:
- [1] Turn off the power switch.
 - [2] Wait about 5 minutes, open the dust chamber and discharge the dust from the drawer.

How shake off the dust

Unlock the snap locks on both sides of the dust chamber door, detach the door, pull out the drawer and discharge the dust from it. Sweep out the dust spilt outside the drawer. To put the drawer back into position, insert it securely on to its guide so there may be no gap between the drawer and the guide. Use care to not attach the dust chamber door upside down (See the sketches below).



Caution

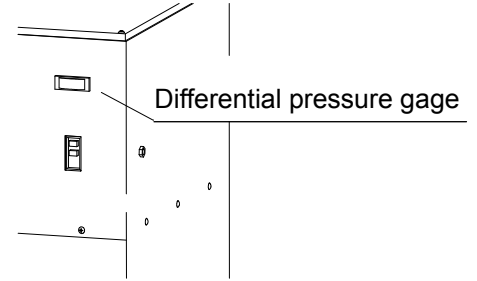
- Although, in case of fine dust, a small amount can leak from the dust collector at its start, this phenomenon will disappear when dust deposits on the filter cloth overall. If, however, the leakage continues, replace the cloth with the optional high-performance type.
- At regular intervals clean the inside of the back-side baffle plate in the filter cloth chamber of adhesive dust sucked and deposited there. If the dust deposits too often, remove the baffle plate during operation.
- To ensure stable suction performance, discharge dust from the drawer at least once a day so too much dust may not remain in the drawer. During discharge, wear protective goggles and gloves and a dustproof mask.
- When the damper is installed, avoid operating the dust collector for an extended period of time with the damper opened fully. Pressure is applied to the inside of the dust chamber by pulses, causing the fatigue durability of the main unit to decrease.
- Filter cloth life in general is one to two years, variable depending on duration of use and amount of dust. Replace the cloth with a new one if differential pressure fails to drop when pulsation is activated.



- Although the filter cloth may not be damaged by usual operation, stop the machine operation and replace the cloth with a new one if it is damaged. Using a damaged filter cloth could not only allow dust to be released into the atmosphere but damage the built-in blower as well.
- Handle powder dust particles collected by the dust collector correctly according to the national or local governmental regulations in the same manner as disposal parts such as old replaced filter cloths, except when reusing them.

Differential pressure indication

The differential pressure gauge on the machine's front indicates differential pressures of the filter cloth (the cloth's blinding levels). Although the cloth's differential pressure may vary a great deal depending on its using condition, make it a rule to operate the machine at 1.5 kPa or under. Generally, the filter cloth's differential pressure has the following tendency:



Filter cloth differential pressure low  high

Dust amount	Small	Large
Dust grain size	Large (50 μ or more)	Small (10μ or under)
Dust attribute	Dry	Somewhat adhesive
Dust specific gravity	Heavy	Light
Treating airflow rate	Low	High

The airflow rate becomes higher than the rated airflow as:
 Filter cloth d.p. + Duct piping resistance ≤ 2.45 kPa (1.96 kPa for CFM-H10)
 Even if the differential pressure has some allowance, please operate the machine at a flow rate lower than the rated value as much as possible by so adjusting the airflow rate.

Pulse setting

Machine operation can also be regulated by changing the pulse settings in the event that the filter cloth differential pressure is high or too low.

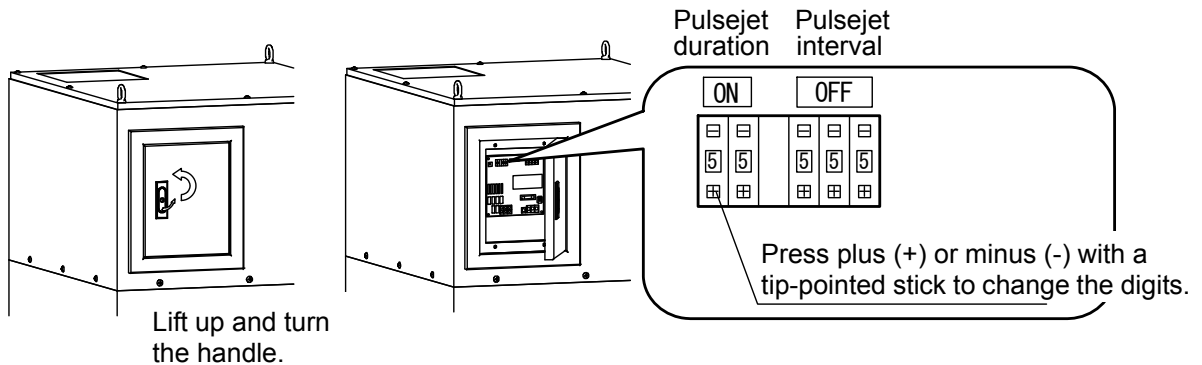
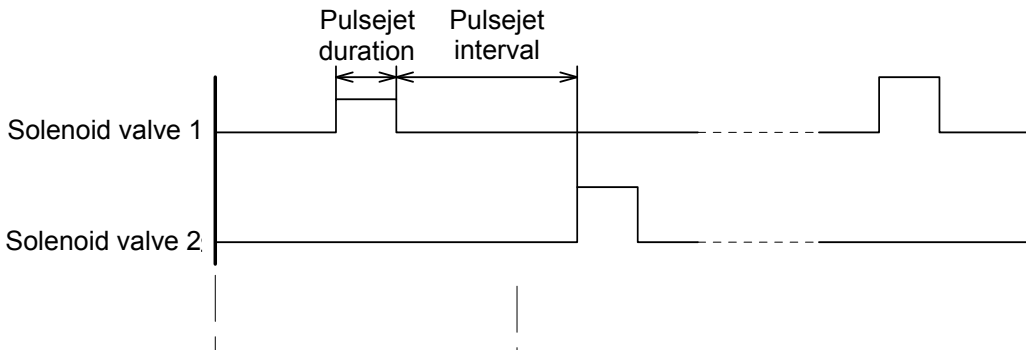
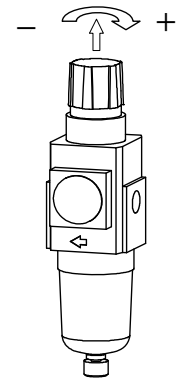
Function	Setting limits	Standard setting	Filter cloth differential pressure	
			Dropping	Rising
Pulse pressure	0.55 MPa to 0.7 MPa	0.6 MPa	High	Low
Pulsejet duration	0.15 to 0.4 sec.	0.2 sec.	Long	Short
Pulsejet interval	7 to 120 sec.	30 sec.	Short	Long

Note: Stick to the above settings during machine operation although it may be possible to set values outside these settings.

When the pulse settings are changed toward a lower filter cloth pressure, compressed-air consumption will increase. So, the amounts of change should be minimised.

To change the pulse pressure, lift up the handle on top of the FR unit and turn it.

The pulsejet duration (on) and the pulsejet interval (off) can be changed by operating the pulsejet selectors (switches) on the pulse control panel in the control box.



There is a possibility of electric shock inside the control box. Before changing the setting, take measures to prevent electric shock such as turning off the power or wearing rubber gloves.



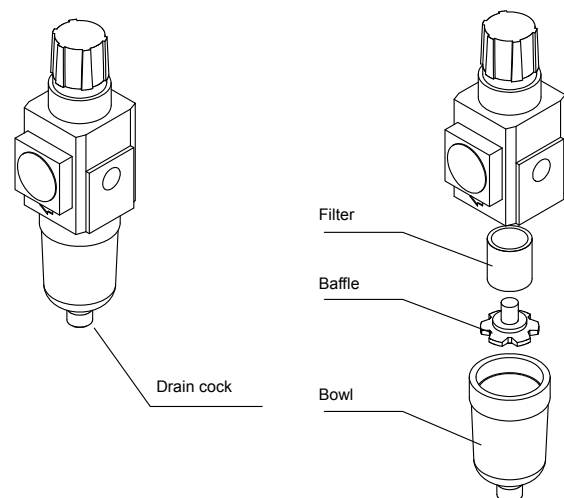
Be sure to maintain the dust collector at regular intervals. This is important to prevent the machine's failure or accident and keep it serving you for many years to come. During the maintenance work, always turn off the power supply to the machine and when replacing the filter cloth use protective goggles and gloves and a dustproof mask.

What and when to inspect

What	When	Description
Maintenance door	Before operation	Must be securely closed.
Filter cloth differential pressure	Twice a day	Measure and record with a differential pressure gauge.
Compressed-air pressure	↑	Measure and record with the pressure gauge of the FR unit.
Pulse action	Once a day	Read the control panel ammeter, etc.
Exhaust air	↑	Dust must not leak.
FR unit drain	↑	No drainage accumulation
Blower vibration	↑	No unusual vibrations or noise
Air piping	↑	No leakage
Blower impeller	Once a month	No dust deposition or wear
Anchor bolts	↑	No loosening
Filter cloth application	↑	Cloth must not come off, loosen or damage.
Joints	↑	No loosened bolt or air leak
FR unit	↑	No filter blinding
Electrical wirings	↑	No poor insulation or loosened terminal
Inside of the machine	One a year	Clean the components of adhered dust.
Machine body	↑	No corrosion or weld crack

Maintaining the FR unit

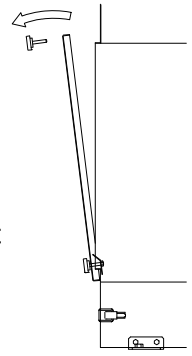
- Discharge the drainage before the bowl is filled by turning the drain cock of the FR unit.
- In case a large amount of drainage is generated, replace the FR unit with a commercially available auto-draining version or install a dryer on the midway of the upstream side of the air piping.
- Clean the filter at regular intervals by washing them with detergent. To do this, detach the filter by turning off the bowl and the baffle.



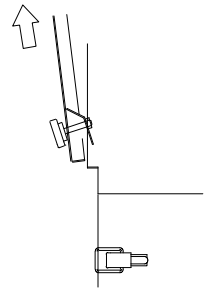
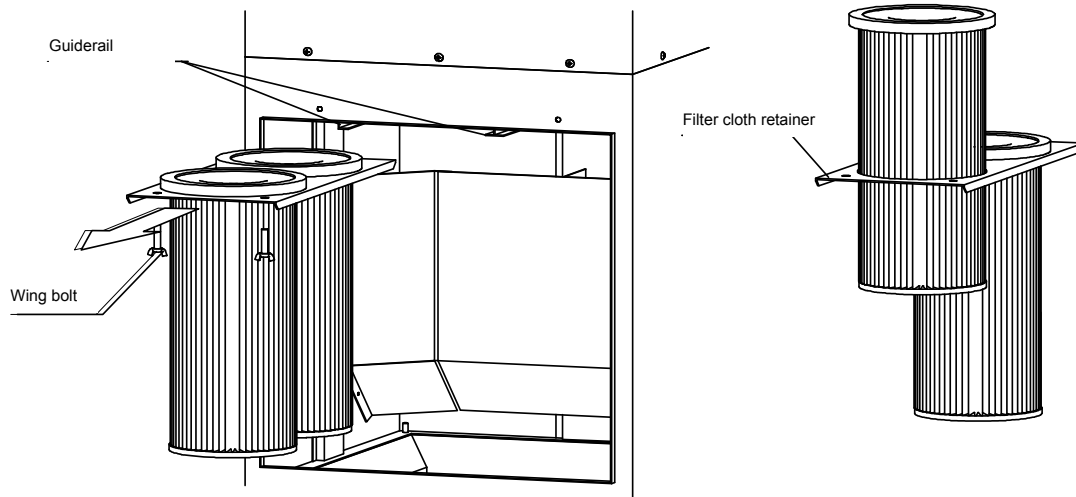
When disassembling the FR unit, be sure to release the residual pressure of compressed air.

Replacing the filter cloth

- [1] Remove the upper cross knob by loosening the lower cross knob on the machine's front door. To detach the door, pull it down to this side and lift it up.
- [2] Loosen off the wing bolts and then draw out the filter cloth retainer to this side.
- [3] Replace the filter cloth with a new one. The cloth retainer should be mounted with the bends at its two sides facing down.
- [4] To mount the cloth retainer, put the retainer on the guiderail and securely push it to the back side.
- [5] Fasten the wing bolts until the gaskets of the filters closely contact with the retainer.
- [6] Mount the front door in position.



Use our genuine filter cloths for replacement.



Replacement filter cloth size and quantity

Model	CFM-H10	CFM-H20	CFM-H30	CFM-H40
Filter cloth size	Ø200 × 500			
Quantity	4 pcs.	6 pcs.	9 pcs.	12 pcs.

Troubleshooting

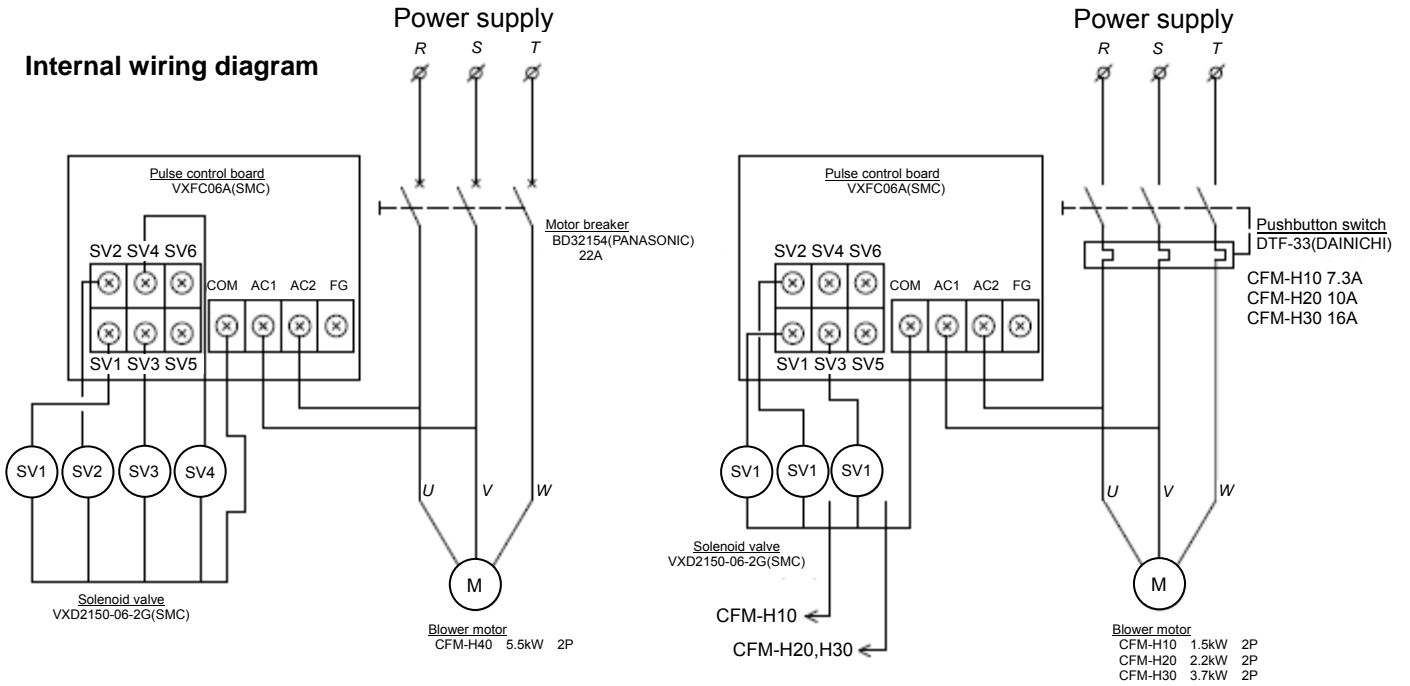
Symptom	Possible causes	Remedies
Blower motor fails to start.	<ul style="list-style-type: none"> • Power absent • Overload protection system in operation • Motor failure 	<ul style="list-style-type: none"> • Turn on the power supply. • Turn off the switch , determine the cause(s), remove it (them) and restart. • Inspect and repair the motor (Consult the manufacturer).
Blower noise, unusual vibrations	<ul style="list-style-type: none"> • Broken motor bearings • Foreign matter mixed • Impeller out of balance 	<ul style="list-style-type: none"> • Replace the bearings. • Remove the foreign matter. • Clean the impeller. <p>Correct the imbalance (Consult the manufacturer).</p>
Blown dust leakage	<ul style="list-style-type: none"> • Broken filter cloth. • Filter cloth mounting error • Packing worn off • Dust particles too fine 	<ul style="list-style-type: none"> • Replace the filter cloth. • Remount the filter cloth. • Replace the packing with a new one. • Replace the filter cloth with a higher-performance version.
Poor suction power	<ul style="list-style-type: none"> • Damper closed • Inlet piping clogged • Filter cloth blinding • Using both side of suction port 	<ul style="list-style-type: none"> • Open the damper. • Clear deposit from the piping. • See the following item. • Please make piping branch only on one side of suction port and pipe it again.
Filter cloth blinding	<ul style="list-style-type: none"> • Insufficient pulse pressure • Pulse intervals too long • Filter cloth's life • Adverse dust attributes 	<ul style="list-style-type: none"> • Increase the pulse pressure (to max. 0.7 MPa). • Shorten the pulse intervals. • Replace the cloth with a new one. • Effective measures should be taken separately.
	• Too much quantity of dust	• Please install pretreatment device like cyclone, sedimentation box etc.
	• Because of too high filtering speed, dust enters into the meshes of filters and cannot be removed by dust removing system.	• Control suction amount by using damper etc.
No pulse available	<ul style="list-style-type: none"> • Power supply to the pulse generator turned off • Solenoid valve failed • Solenoid valve wiring broken • No compressed air supplied • Pulse control board failure 	<ul style="list-style-type: none"> • Turn on power supply to the pulse control board. • Inspect the fuse. • Replace the solenoid valve. • Inspect the wiring. • Inspect the air piping. • Replace the board.
Pulse fails to stop.	<ul style="list-style-type: none"> • Solenoid valve failure 	<ul style="list-style-type: none"> • Clean or replace the valve.

Specifications

Type	CFM-H10	CFM-H20	CFM-H30	CFM-H40
Motor	1.5 kW 2 P	2.2 kW 2 P	3.7 kW 2 P	5.5 kW 2 P
Airflow rate (m ³ /min)	20	30	40	60
Static pressure (kPa)	1.96	2.45		
Filtration area (m ²)	10.4	15.6	23.4	31.2
Number of filter cloths (pcs.)	4	6	9	12
Number of solenoid valves (units)	2	3	3	4
Filter cloth size (mm)	φ200 × 500			
Filter cloth material	Polyester, moulded			
Noise level (dB(A)) ^{Note 1}	62	68	68	71
Compressed-air consumption (L/min) ^{Note 2}	40	50	60	80
Drawer capacity (L)	28	39	32 × 2 drawers	65 × 2 drawers
Product mass (kg)	179	218	281	392

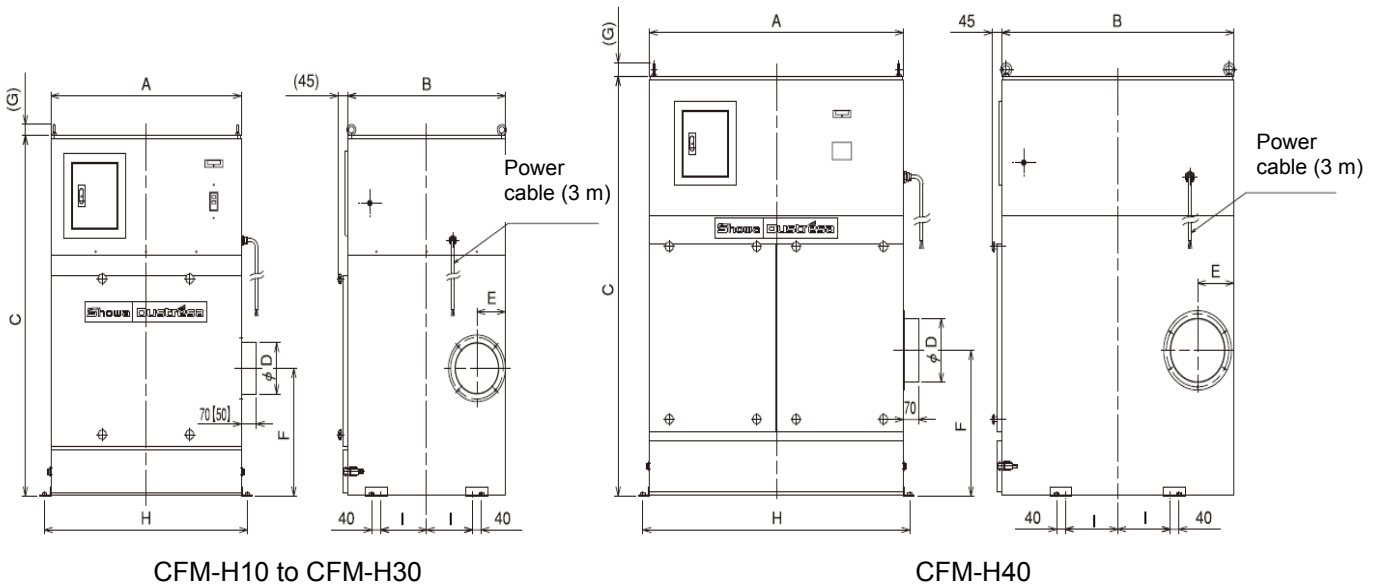
Note 1: The noise levels were measured at 1.5 meters apart from the machine's front after installation of the suction duct piping. The levels may vary depending on the environment and condition of use.

Note 2: The compressed-air consumption amounts were converted into atmospheric pressures at the standard pulse settings.



Model	Dimensions								
	A	B	C	D	E	F	G	H	I
CFM-H10	650	720	1415	150	105	500	42	710	210
CFM-H20	870	720	1410	200	130	500	42	930	210
CFM-H30	870	1000	1495	225	145	500	42	930	250
CFM-H40	1160	1060	1640	250	160	570	42	1240	250

Outside dimensions (mm)



CFM-H10 to CFM-H30
 The numeric values in brackets **【】** show the dimensions of the CFM-H10.

Scope of warranty

Repair service is provided free of charge for a failure during the warranty period, as long as the blower 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, the warranty does not cover costs for removal from such equipment, reattachment to such equipment, costs of other incidental work, costs of transportation etc., resulting opportunity loss incurred by the customer, lost operation, or any other indirect loss or damage suffered by the customer.

- For requests for repair service, please contact our nearest branch or sales office.

Warranty period

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

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

- 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 modification
- Failure or damage due to transportation, dropping, etc. after the purchase
- Failure or damage due to fire, earthquake, storm, flood, lightening or other natural disasters, environmental factors such as salt damage and public pollution, abnormal voltage, use of a power supply (voltage or frequency) other than that specified, or the like
- Failure or damage due to repair or modification (including punching, etc. in the product) not conducted by our company
- Failure or damage due to the use of parts other than those designated by our company
- Trouble when I absorbed the dust except the meeting and the damage
- The trouble that damage of the filter cloth and the packing that happened by having absorbed a sharp material depends on and the damage
- Discoloration, scratching, natural consumption of consumable parts or other defects due to use or deterioration over time
- Failure or damage caused by neglecting the maintenance and inspection described in the Operating Instructions
- Expendable supplies including the filter cloth and packing

We will not compensate for any loss or damage resulting from defects that occur during the use of this product.

[Notices]

- (1) The descriptions in these Operating Instructions are subject to change without prior notification in the future.
- (2) We have made all possible efforts to prepare these Operating Instructions. However, if you have any questions about them or find any inquiries, errors, omissions, etc., please contact our nearest branch or sales office.
- (3) If the power supply frequency changes due to a change in the location where the blower is used, it may not be used as it is. We will consider a measure in each case where it is required. In such a case, please contact our nearest branch or sales office.
- (4) At the time of inquiry, please describe the product type and the manufacturing number indicated on the product nameplate.

Notes : We are not responsible for any accident or breakdown caused by different/wrong use from this manual, and improper repair or remodeling.



Business Promotion Dpt.

1-25 Shinden Kita-machi, Daito-city, Osaka, Japan 574-0052

Tel: +81-72-870-5708 Fax: +81-72-870-7243

Email: sales@showadenki.co.jp

<http://www.showadenki.co.jp>