

# REGENERATIVE BLOWERS

## Ring Compressor

# IAC

INDUSTRIAL ACCESSORIES COMPANY

### Principles of Operation

The Fuji Ring Compressor is a non-positive displacement, high volume, low pressure blower that can operate as either a compressor or a vacuum pump. It is also known by other names such as: regenerative blower, vortex blower, and side-channel blower. All of the names describe the basic principle of operation of the blower.

The blower consists of an impeller mounted directly on a motor shaft and is rotated at a high speed, about 3600 RPM. On the periphery of the impeller is a large number of radial blades. The impeller is positioned between two end-plates with the blades located with a channel on either side (hence, the name "side-channel").

As the impeller spins and the blades pass the inlet port, a low pressure area is created that draws in air, or other gases. The impeller blades impart motion to the air by centrifugal force, throwing it outward and forward, where it follows the contour of the side-channel and is returned to the base, or root, of the impeller. This action is repeated many times, creating a vortex. Each "regeneration" causes the air to gain pressure until it reaches the portion of the housing where the air is stripped

from the impeller and discharged from the blower.

MODEL NO	Horse Power	Max. Flow Rate	Max. Pressure
VFC06	1/20	17.7 scfm	10 in. H2O
VFC08	1/10	19.5	19.5
VFC10	1/6	27	27.5
VFC20	1/3	42	34
VFC30	1/2	56	50
VFC40	1	98	54
VFC50	2.5	154	80
VFC60	4.5	206	118
VFC70	7	267	114
VFC80	10	388	135
VFC90	20	570	139

The ring compressor is, in effect, a multi-stage compressor with each regeneration of the air becoming another "stage". The pressure increase at each stage in the cycle is very small, but the large number of stages yields inlet vacuum levels of up to 8 in. Hg and discharge pressures of up to 5 PSIG, depending on the size of the blower. Flow levels of up to 570 SCFM can be achieved, and discharge air is free of annoying pulsations.



Detailed performance data, curves, temperature rise, sound level information and a complete line of accessories are available. Please contact an IAC sales representative for details.

FOR MORE INFORMATION OR TO PLACE AN ORDER CONTACT IAC TODAY

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### Installation

The blowers may be used for handling non-corrosive, non-combustible and nonexplosive gases as well as air. The gas temperature and ambient temperature should be kept at less than 104°F, and the relative humidity at less than 80%.

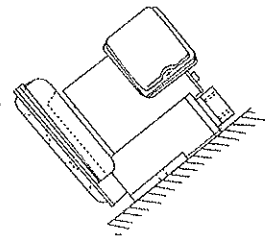
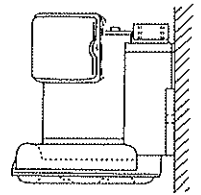
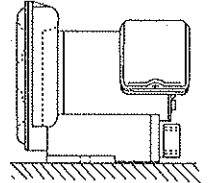
The blowers can be installed in most directions. When installing the blower the motor axis mounted vertically or at an angle, it is important to keep the impeller side downward (motor side upward). The VFC70, VFC80 and VFC90 should only be installed with the motor axis mounted horizontally for longer life.

Do not install the Ring Compressors on a base that is subject to vibration. The mounting base should be rigid enough to prevent resonance. Rubber feet, pads, or other vibration absorption materials are recommended.

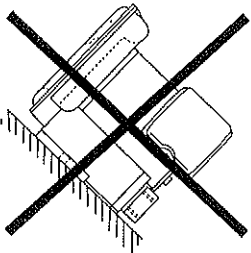
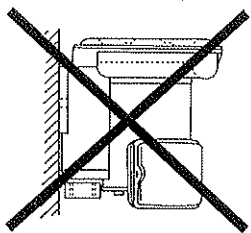
### Solid Particles

Gases contaminated by solid particles must be filtered before entering the blower. Fuji offers a complete line of accessories designed to remove all types of contaminants, which include: inlet filters for both pressure and vacuum, filter traps, and cyclone separators and receivers. These can be used to prevent dust, dirt, lint, threads, and water from entering the blower inlet.

### Correct



### Incorrect



### Direction of Rotation

All Fuji Ring Compressors have an arrow located on the blower housing to indicate the proper direction of rotation, and all blowers operate in a counterclockwise direction when viewed from the motor side. This can be checked by watching the fan on the motor, or by feeling the airflow entering or exiting the blower inlet and outlet, which are labeled "IN" and "OUT", respectively. All three phase units may have the direction of rotation reversed by switching the two main power leads. All single phase units operate in one direction of rotation only, regardless of wire connections.

When three phase units operate with reversed rotation, a loss of performance will result, and airflow will be reversed. Some applications may benefit from this type of operation; please contact the factory for information.

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### **Temperature**

The temperature rise of air passing through the blower can be determined from each product's performance data charts.

### **Continuous Operation**

When operating Fuji Ring Compressors, the air flow can be throttled between the open-flow (0" H<sub>2</sub>O pressure difference) to a blank-off condition (zero flow). The blank-off duration of the blower must not exceed the maximum allowable time (3 phase wiring diagrams). If the blower will be operating in a continuous mode, it requires a minimum amount of air flow. Fuji offers pressure and vacuum relief valves that are set at the correction point to allow proper operation of the blower. When using relief valves, the blower must be rotated in one direction only.

Models VCF60-VFC70 and smaller must be limited to 10 starts per hour; models VFC70 and larger must be limited to 4-6 starts per hour for extended life.

# CAPABILITIES

## Equipment, Parts & Service

### One-Stop Source



### Capital Equipment

- Dust Collectors/Baghouses
- Dust Collection Systems
- M-Pulse Baghouse
- Blower Packages
- Pneumatic Conveying Systems
- Silos & Tanks
- Bulk Storage Systems
- Pneumatic Filter Receivers
- Railcar Unload Systems
- Mercury Control
- Air Pollution Control

### Industries Served

- Wood Products
- Grain Agriculture
- Food
- Cement
- Ethanol
- Steel
- Foundry
- Mining
- Bio Fuels
- Petro Chemical
- Plastics
- Coal
- Power Generation
- Pulp & Paper

### Capabilities

- Design Layout - Auto Cad 2007, 3-D Solid Works & Inventor
- Structural Steel Fabrication
- Design Build Projects
- Mechanical Contracting
- Mercury Control Testing
- Equipped Service Trucks



### Services, Construction & Maintenance

- Contract Fabrication
- Consulting Services
- Equipment
  - Installation
  - Relocation
  - Repair
- Baghouse Rebagging
- Baghouse Conversions
- Turn-Key Installation
- System Inspections

### After Market Parts & Equipment

- Blowers
- Airlocks
- Diverter Valves
- Hose
- Bags
- Cages
- Tubing
- Couplings
- Elbows
- Sonic Horns
- Knife Gates
- Butterfly Valves
- Baghouse Accessories
- Level Indicators
- Bin Activators
- Convey Line Accessories
- Intake Filters
- Fans
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