Fuji Electronic VFC 084P-5T

Fuji’s complete line of ring compressors is designed to meet the most critical application requirements. Each features an impeller, mounting base and housing manufactured of aluminum alloy for maximum strength, reduced weight and increased corrosion resistance. The compressor and motor are constructed as a unit for mechanical simplicity and maximum structural integrity. The elimination of clutches, gears, belts, and sliding vanes reduces periodic maintenance while increasing reliability.

Reduces noise levels to below OSHA standards. Promotes smoother air flow and higher volumetric efficiency. Smoother operation. Allows vibration-free installation in OEM equipment. Better grease retention. Increased reliability. Protects bearings from contaminants for longer life. Eliminates the need for couplings, belts, or gears. Nothing to break or wear out. Minimizes OEM inventory requirements. Cools the motor and blower. Quieter running and more efficient. Protects the motor from overheating for greater reliability by cooling the motor and blower. Easy replacement in OEM equipment.

Features:
- Suction and discharge silencers
- Die cast impeller
- Dynamically balanced impeller
- Double shielded shaft bearing
- Dust-proof shaft seal
- Motor shaft-mounted impeller
- 50/60 Hz motors, wide voltage range
- Improved cooling fan design
- Built-in thermal protector
- Compact design
- Removable threaded flanges

Contact us for a price on this Refurbished Enclosed Fuji Electronic Blower!

363 W. SOUTH AIRPORT ROAD - TRAVERSE CITY, MI 49686 - BUS: (231) 264-3000 - FAX: (231) 264-3001
6140 RASHELLE DRIVE, SUITE 1 - FLINT, MI 48507 - BUS: (810) 238-9190 - FAX: (810) 238-9195
7082 GRANGE HALL ROAD - HOLLY, MI 48442 - BUS: (800) 423-2043

www.global-treatmentsolutions.com
Fuji Electric, established in 1923, is a world leader in the electric and electronics industries. Originally a heavy electrical equipment manufacturer, Fuji Electric has grown to include power and energy systems, industrial and electrical controls, electronics, information processing, semiconductors, process and factory automation equipment, robot control systems, fuel cells and vending machines.

In 1963, Fuji Electric introduced a line of Ring-Compressors in Japan, followed in 1970 by their introduction in the United States. This product was intended to meet the increasing needs of sophisticated equipment for substantial volumes of oil-free compressed air and vacuum at low to moderate pressures. Since that time, these units have gained an unexcelled reputation for performance, reliability and quality in thousands of applications, and in all types of environments. They have been constantly improved to meet even more demanding performance and environmental specifications.

This catalog introduces the latest series of Ring-Compressors manufactured by Fuji. While general performance specifications remain unchanged, these new series meet the need of increasingly stringent noise requirements, with quieter operating units.

Fuji Electric maintains worldwide sales and service facilities to provide the fastest possible response to calls for applications assistance as well as customer service. If any further information regarding any of the material in this catalog is necessary, our sales representatives will be only too happy to provide assistance.
**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.

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.

The basic construction of a ring compressor means that the only moving part is the impeller. Nothing touches except the bearings. The method of compression means that there is no requirement for lubrication in the compression chamber; the discharge air is oil-less. No oil aerosols are present in the discharge air; nor carbon dust generated by sliding vanes. The blowers may be mounted vertically (with impeller housing down) or horizontally.

**CONSTRUCTION**

Fuji’s complete line of ring compressors is designed to meet the most critical application requirements. Each features an impeller, mounting base and housing manufactured of aluminum alloy for maximum strength, reduced weight and increased corrosion resistance. The compressor and motor are constructed as a unit for mechanical simplicity and maximum structural integrity. The elimination of clutches, gears, belts, and sliding vanes reduces periodic maintenance while increasing reliability.

TEFC (totally enclosed, fan-cooled) motors are standard on all models, except VFC063P and VFC100 models, which are TENV (totally enclosed, non-ventilated). In addition, all models have NEMA class B, or class F (model VFC704), insulation, and are Underwriters Recognized (Yellow Card File E54355), CSA certified (File LR48762), and meets CE. All single phase units have built-in automatic reset thermal protectors, except models VFC400P and VFC504P. All three phase units have pilot duty thermal protectors requiring only the addition of an external contactor for overload protection, however, magnetic motor starters are recommended.

All ring compressor impellers are dynamically balanced to virtually eliminate vibration while increasing overall long-term reliability. Most models have a shaft oil-seal between the impeller and bearing, as well as a double shielded bearing to reduce the possibility of foreign material influx and preclude air contamination.
**Features**

- Suction and discharge silencers
- Die cast impeller
- Dynamically balanced impeller
- Double shielded shaft bearing
- Dust-proof shaft seal
- Motor shaft-mounted impeller
- 50/60 Hz motors, wide voltage range
- Improved cooling fan design
- Built-in thermal protector
- Compact design
- Removable threaded flanges

**Benefits**

- Reduces noise levels to below OSHA standards. Makes it more comfortable for employees working near the blowers.
- Promotes smoother air flow and higher volumetric efficiency.
- Smoother operation. Allows vibration-free installation in OEM equipment.
- Better grease retention. Increased reliability.
- Protects bearings from contaminants for longer life.
- Eliminates the need for couplings, belts, or gears. Nothing to break or wear out.
- Minimizes OEM inventory requirements.
- Cools the motor and blower. Quieter running and more efficient.
- Protects the motor from overheating for greater reliability.
- Space saving design makes it easier for OEM’s to incorporate the blower into their equipment.
- Easy replacement in OEM equipment.
Fuji Prefix

Numbers 0-9 = Blower Size

Special Blower Reference

Configuration Control Number

P = Single Phase Blower

A = Three Phase Blower

Voltage Designation:

1T = 115V; 50/60 Hz; 1 Ph.
2T = 230V; 50/60 Hz; 1 Ph.
200-230V; 50/60 Hz; 3 Ph.
5T = 115V/230V; 50/60 Hz; 1 Ph.
4W = 460V; 50/60 Hz; 3 Ph.
7W = 200-230/460V; 50/60 Hz; 3 Ph.
5W = 575V; 60 Hz; 3 Ph.

(For specific electrical data see pages 50, 51)
# Table of Contents

**Company Profile** ............................................................................................................................................................... 1

**Principle of Operation** ............................................................................................................................................................. 2

**Construction** ........................................................................................................................................................................... 2

**Features and Benefits** ............................................................................................................................................................ 3

**Selection Guide** ......................................................................................................................................................................... 4

**Technical and Performance Data**  
- VFC063 ................................................................. 6  
- VFC084 ................................................................. 8  
- VFC100 ................................................................. 10  
- VFC200 ................................................................. 12  
- VFC300 ................................................................. 14  
- VFC400 ................................................................. 16  
- VFC504P/500A ...................................................... 18  
- VFC600 ................................................................. 20  
- VFC704 ................................................................. 22  
- VFC804 ................................................................. 24  
- VFC904 ................................................................. 26

**Accessories**  
- Inlet Filter ........................................................................ 28  
- Inlet Filter Covers ........................................................ 28  
- Inlet Filter / Silencers ...................................................... 28  
- Inlet Filter / Silencer Replacement Elements .................. 28  
- Inline Vacuum Filters ................................................... 29  
- Inline Vacuum Filter Replacement Elements ................. 29  
- Inline Filter Traps ......................................................... 30  
- Exhaust Silencer (Mufflers) .......................................... 30  
- Inlet Filter / Receivers .................................................. 31  
- Fiberglass Screen Collection Bags .............................. 31  
- High Volume Filter / Receivers .................................... 32  
- Canton Flannel Filter Bags ........................................ 32  
- Disposable / Reusable Filter Bags ............................... 32  
- Vacuum and Pressure Relief Valves ............................. 33  
- Vacuum Boosters ...................................................... 34  
- Aspirators ...................................................................... 34  
- Blower / Aspirator Performance Curves ....................... 35  
- Air Knives ..................................................................... 38

**Applications**  
- General Classifications .............................................. 36  
- Typical Applications ................................................... 37  
- Spas and Hot Tubs ....................................................... 40  
- Tank Agitation ......................................................... 42  
- Tank Ventilation ......................................................... 43

**Engineering**  
- Air Flow Through an Orifice ......................................... 44  
- Flow Coefficients for Orifices ...................................... 45  
- Pressure Drop Through Tubing .................................... 46  
- Altitude-vs-Barometric Pressure ................................. 47  
- Temperature Conversion Chart ................................... 48  
- Conversion Charts ...................................................... 49

**Electrical** ............................................................................................................................................................................... 50

**Design Considerations** ....................................................................................................................................................... 52

**Operating Limits** .............................................................................................................................................................. 53
The VFC084 is a single-stage ring compressor with a maximum pressure of 19.5 in. H₂O, and a maximum vacuum of 18.7 in. H₂O, and a maximum capacity of 19.5 SCFM. It comes complete with a direct-drive, 1/10 horsepower, TEFC motor capable of operating on a wide range of voltages and on 50 or 60 Hz. A pilot-duty thermal protector is standard equipment on all 3-phase models, and built-in automatic reset thermal protectors on 1-phase units. All versions have NEMA class B insulation, are UL recognized, CSA certified and CE.

### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Hz</th>
<th>Voltage Low/Medium Voltage</th>
<th>Amps (Locked Rotor)</th>
<th>Max. Pressure Max. Vacuum Max. Airflow Min. Airflow Max. Temp Rise (°F/°C)</th>
<th>Weight lbs.(kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFC084P-5T</td>
<td>60</td>
<td>115/230</td>
<td>1.2/0.6</td>
<td>3.0/1.7</td>
<td>19.5 18.7 19.5 0 54(30)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>110/220</td>
<td>1.1/0.5</td>
<td>3.2/1.6</td>
<td>15 14.4 16.5 0 36(20)</td>
</tr>
<tr>
<td>VFC084A-2T</td>
<td>60</td>
<td>200-240</td>
<td>0.42-0.40</td>
<td>1.8-2.1</td>
<td>19.5 18.7 19.5 0 54(30)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>190-230</td>
<td>0.37-0.41</td>
<td>1.8-2.1</td>
<td>15 14.4 16.5 0 36(20)</td>
</tr>
<tr>
<td>VFC084A-4W</td>
<td>60</td>
<td>400-460</td>
<td>0.21-0.20</td>
<td>0.9-1.1</td>
<td>19.5 18.7 19.5 0 54(30)</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>380-360</td>
<td>0.18-0.20</td>
<td>0.9-1.1</td>
<td>15 14.4 16.5 0 36(20)</td>
</tr>
</tbody>
</table>

3-Phase version shown
Contact factory for other versions

### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Vacuum Relief Valve</th>
<th>Pressure Relief Valve</th>
<th>Inlet Filter</th>
<th>Inlet Filter Cover</th>
<th>Inlet Filter/Receiver</th>
<th>Exhaust Silencer/Muffler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model No.</td>
<td>Not Req’d</td>
<td>Not Req’d</td>
<td>F-123</td>
<td>C-123</td>
<td>R1SP1.5</td>
<td>VFY-021A</td>
</tr>
<tr>
<td>See Page No.</td>
<td>–</td>
<td>–</td>
<td>28</td>
<td>28</td>
<td>31</td>
<td>30</td>
</tr>
</tbody>
</table>

NOTE: Maximum allowable time at deadhead is unlimited
PERFORMANCE DATA

**Pressure**

- Graphs showing pressure versus flow (SCFM) for different frequencies (60 Hz, 50 Hz).
- Axes labels:
  - X-axis: Flow (SCFM)
  - Y-axis: Pressure

**Vacuum**

- Graphs showing AMPS, WATTS, and STATIC PRESSURE versus flow (SCFM).
- Axes labels:
  - X-axis: Flow (SCFM)
  - Y-axis: AMPS, WATTS, STATIC PRESSURE

**Temperature Rise**

- Graphs showing temperature rise (Degrees F, Degrees C) versus flow (SCFM).
- Axes labels:
  - X-axis: Flow (SCFM)
  - Y-axis: Temperature Rise

**Sound Level**

- Graph showing sound pressure level (dBA) versus frequency (Hz).
- Axes labels:
  - X-axis: Frequency (Hz)
  - Y-axis: Sound Pressure Level (dBA)
  - Note: Measured at distance of 1.0 meters