



Commercial Spa **Blower Selection Guide**

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SPAS AND HOT TUBS

Most spas and hot tubs require regenerative blowers to provide the pressure and flow needed to agitate the water. Sizing a blower can be as simple as following these steps:

1. Determine the number of jets and/or orifices in the spa.
2. Calculate the total area of all the orifices.
Total area = (No. of holes) x 3.14 x radius²
3. Select the proper blower by finding the number and size of the orifices (or jets), making sure that the maximum depth for the blower is not exceeded.

Table 1

ORIFICE AREA CHART	
Orifice Size	Area (in. ²)
1/8" (0.125)	0.012
5/32" (0.156)	0.019
3/16" (0.188)	0.028
7/32" (0.219)	0.038
1/4" (0.250)	0.049

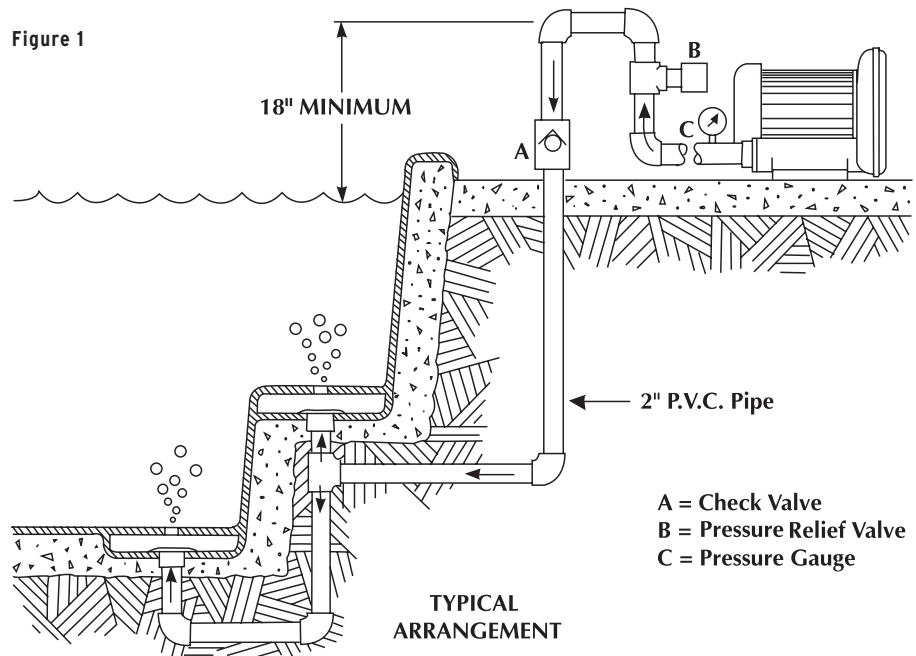
Table 2

SPA SURFACE AREA CHART (FT. ²)			
Spa Depth	BLOWER MODEL		
	VFC40	VFC50	VFC60
30"	64	105	140
36"	52	98	128
42"	46	92	117
48"	—	86	111

NOTES

1. Two 45° ells are preferred to one 90° ell.
2. Install a loop at least 18" above the water level.
3. If back-pressure on the blower is excessive, it may be necessary to add more orifices, or to enlarge the existing orifices.
4. A check valve with a very low pressure drop should be placed in an accessible location, close to the spa (A).
5. Piping to the spa should be 2" or greater. On runs longer than 50', the first 25' should be 2.5" minimum and the blower size may need to be increased due to pressure drops over longer distances. Due to the discharge temperature from some blowers (depending on operating conditions) PVC pipe may not be a satisfactory material.
6. **The blower is an "air-only" device. It is not a pump for water.**

Figure 1





EXAMPLE

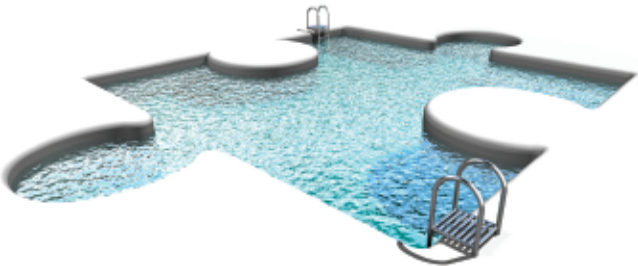
Select a blower for a 6' x 6' spa with a depth of three feet, that has (50) .1875" orifices:

1. Number and size of orifices = 50 x .1875"
2. Total area of orifices = $50 \times 3.14 \times .0942^2 = 1.39 \text{ in.}^2$
3. From the Blower Selection Chart 1.39 in.² is greater than the minimum requirement for a VFC40 blower. The depth of 36" is within the maximum limit for water depth. Therefore, the VFC40 blower should be selected.

BLOWER SELECTION CHART

Model	Maximum water depth	Number of jets	Orifice size	Minimum number of orifices	Minimum total orifice area (in. ²)
VFC40	42"	3 - 7	1/8"	98	1.2
			5/32"	63	
			3/16"	43	
			7/32"	32	
			1/4"	25	
VFC50	64"	8 - 13	1/8"	162	2.0
			5/32"	105	
			3/16"	72	
			7/32"	53	
			1/4"	41	
VFC60	84"	12 - 17	1/8"	244	3.0
			5/32"	157	
			3/16"	109	
			7/32"	80	
			1/4"	61	

SPA BLOWER DO'S AND DON'TS



Do

1. Use a licensed electrician to install your blower.
2. Use a Pressure relief valve.
3. Use a Hartford loop at least 18 inches above the water level of the spa.
4. Install the blower as close to the spa as possible.
5. Install the blower in a weatherproof house or enclosure.
6. Install a check valve as close to the spa as possible.
7. Install an Inlet Filter on the blower.

Don't

1. Don't install the unit lower than the water level of the spa.
2. Don't allow water into the blower. Water will damage the blower and void the warranty.

PILOT DUTY THERMAL PROTECTION

All Fuji Blowers are provided with Pilot Duty Thermal Protection. This Thermal Protection is in the form of a normally closed thermal switch located in the motor windings with terminations at electrical terminals P1 and P2 in the terminal box. The Thermal Switch is rated for low voltage control voltages, either 12 or 24 VDC or 115 VAC. The Thermal Switch opens at 275 degrees F and closes at 190 degrees F. This thermal switch is meant to be used for motor protection and should be wired into the safety circuit of the motor starter.

Diagram 1



Diagram 2

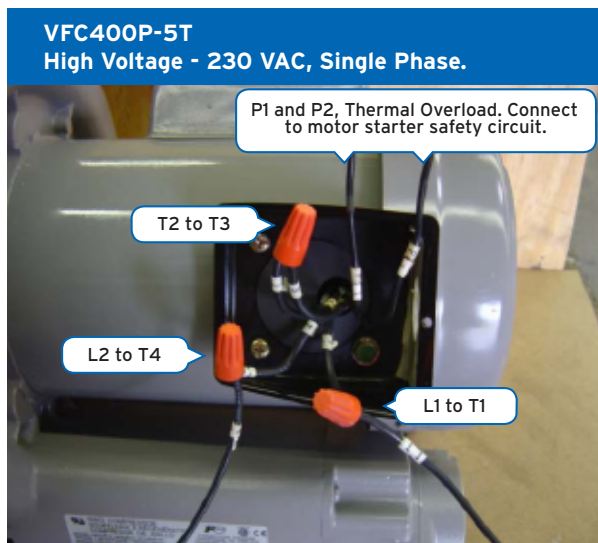
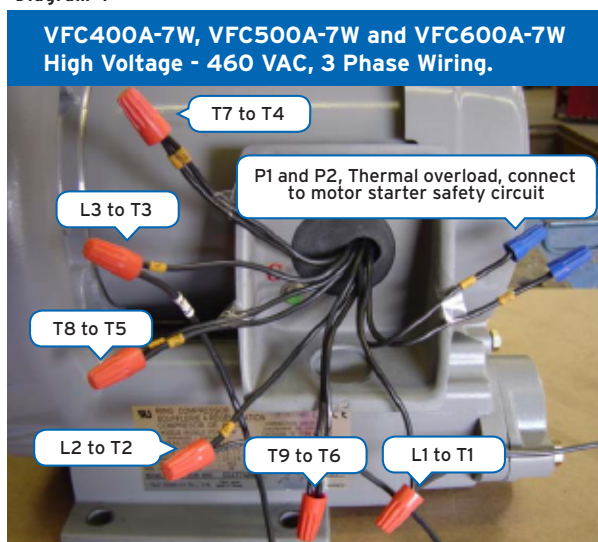


Diagram 4



Wiring Diagrams

1. VFC400P-5T – Low Voltage – 115VAC, 1-phase
2. VFC400P-5T – High Voltage – 230 VAC, 1-phase
3. VFC400A-7W – Low Voltage – 230 VAC, 3-phase
VFC500A-7W – Low Voltage – 230 VAC, 3-phase
VFC600A-7W – Low Voltage – 230 VAC, 3-phase
4. VFC400A-7W – High Voltage – 460 VAC, 3-phase
VFC500A-7W – High Voltage – 460 VAC, 3-phase
VFC600A-7W – High Voltage – 460 VAC, 3-phase
5. VFC508P-2T – 230 VAC, 1-phase

Diagram 3

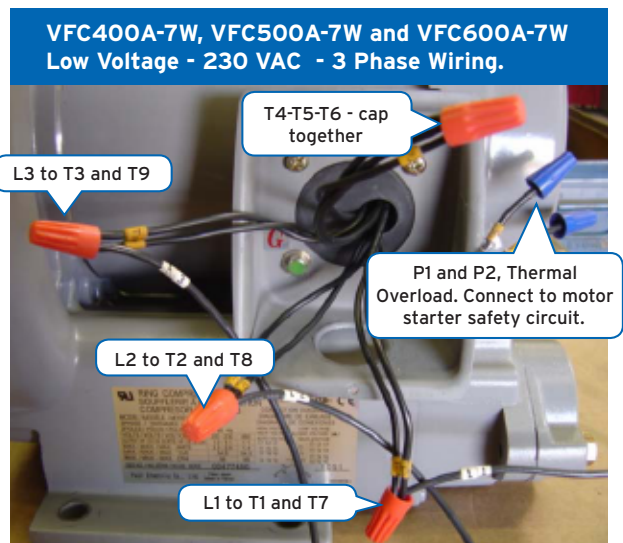
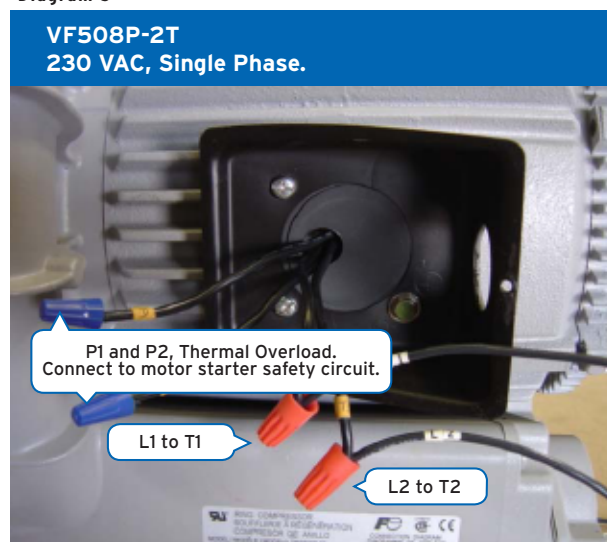


Diagram 5





Blower Model	HP	Voltage	Inlet Filter	Pressure Relief Valve
VFC400P-5T	1.0	115/230 VAC, 1-Phase	F-45	PV-4
VFC400A-7VW	1.0	230/460 VAC, 3-Phase	F-45	PV-4
VFC508P-2T	2.5	230 VAC, 1-Phase	F-45	PV-5
VFC500A-7VW	2.5	230/460 VAC, 3-Phase	F-45	PV-5
VFC600A-7VW	4.5	230/460 VAC, 3-Phase	F-67	PV-6

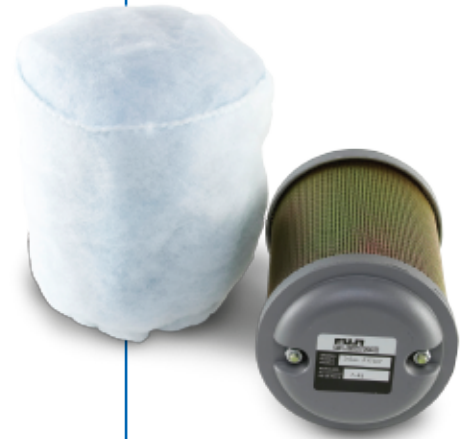
WARRANTY

Fuji Electric Corp. of America warrants that each Fuji Electric Regenerative Blower is free from defects in material and workmanship at the time of shipment. This warranty covers the period of eighteen months following the date of shipment. Thermal protection must be connected as recommended.

The product or parts found to be defective in materials or workmanship during this period will be repaired or replaced at no charge to the customer.

This warranty does not apply to any product or parts subject to damage in transit, accident, misuse or abuse. Damage to the blower by applying incorrect voltage is considered misuse and is not covered by warranty.

The warranty process requires that the unit be returned to Fuji's Warranty Service Center for evaluation. The cost of freight to the Service Center is to be borne by the customer. Blowers which are deemed to be covered under the warranty will be repaired or replaced to the customer. Fuji will reimburse customers for the cost of freight for units covered under the warranty. Note that evidence of water internal to the blower voids the warranty.



Customer Service:

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