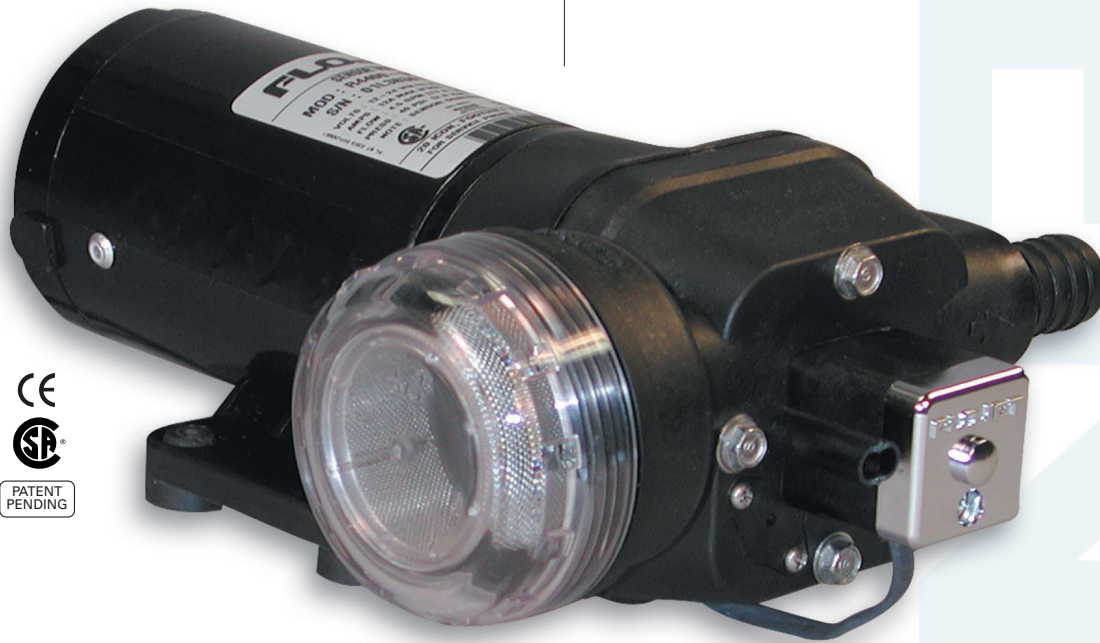


## *Variable Speed Means Constant Pressure*



## Flojet Rewrites the Book on Small Pump Control

The new R4400 Sensor VSD™ provides pulse free constant pressure operation on any DC voltage from 10 – 29 volts. Operation from no flow to maximum flow is system controlled, eliminating unwanted pump cycling and the need for an accumulator tank. The system provides reduced amp draw and ultra quiet operation when less than maximum flow is required. Standard features include soft start to reduce splash, thermal overload, over-current and reverse polarity protection.

### HOW IT WORKS

- **Hall Effect Sensor (Patent Pending)** continuously monitors pump outlet pressure
- **Micro Controller System (Patent Pending)** varies motor speed to maintain constant pressure
- **Automatically adjusts** when flow or supply voltage fluctuate

Flojet



ITT Industries

# FLOJET

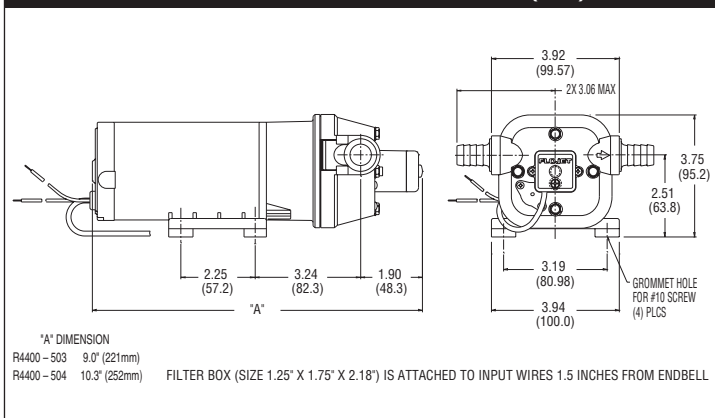
Sensor VSD™ makes system design easy. It automatically adjusts in real time to changes in flow due to the number of nozzles in operation, filter back pressure, and changes in working fluid viscosity ... so you don't have to.

The Sensor VSD™ constant pressure pump system matches motor speed to system demand. As more liquid is needed, the motor responds to increase flow. Conversely, as the demand lessens the motor slows to a "super quiet" speed, always maintaining a constant system pressure. The result is exceptional pulse free flow and very low amp draw.

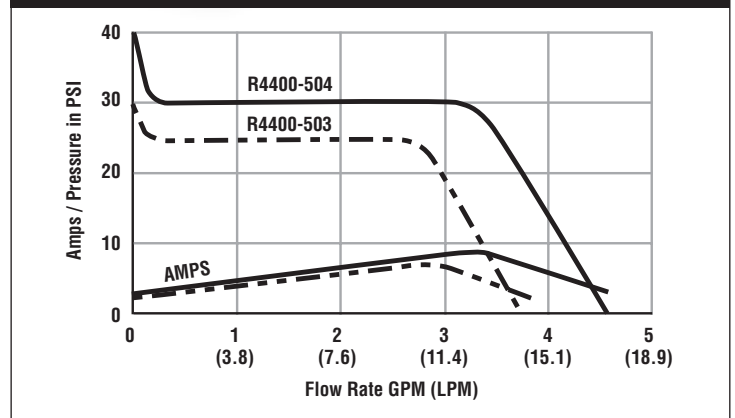
## PRODUCT FEATURES

- Micro Controller System Maintains Constant Pressure
- Automatically Adjusts to 12V or 24V DC Operation
- Hall Effect Pressure Sensor - Patent Pending
- No Mechanical Switch, Points, or Contacts
- Reduced Amp Draw at Low Flow Rates
- CSA Listed for US and Canadian Sales
- Space Saving, Eliminates Accumulator Tank

### DIMENSIONAL DRAWING Inches (mm)



### PUMP CURVE



Model Number	Supply Voltage	Amp Draw 12V (24V)	Max Fuse	Flow GPM (LPM)	Sensor Pressure	Shut-Off Pressure	Inlet Strainer
R4400-503	12-24V DC	8.0A (4.0)	15A	3.7 (13.5)	25 psi (1.7 bar)	35 psi (2.8 bar)	Yes
R4400-504	12-24V DC	12.0A (6.0)	15A	4.5 (16.3)	30 psi (2.1 bar)	40 psi (2.8 bar)	Yes

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Flojet

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# FLOJET®

## Models R4400-503 3.7 GPM R4400-504 4.5 GPM

### SENSOR VSD™ PUMP SYSTEM

#### FEATURES

- Constant Pressure Operation
- Variable Speed Control
- Solid State Pressure Sensor
- Nearly Silent Operation / No Cycling
- Operates on 12V DC or 24V DC
- Controls Pressure by Changing Motor Speed
- Self-priming / Runs Dry Without Damage
- No Accumulator Tank Needed
- CSA Listed / EN ISO 8846 Marine / C.E. Certified
- Patent Pending



#### SPECIFICATIONS

**Motor:** Permanent magnet DC type  
Totally enclosed, non-vented  
Double ball bearing armature  
Electronic speed control.

**Pump:** Four piston diaphragm type  
Poly propylene body  
Viton valves  
Santoprene diaphragm  
Self-priming 8-10 vertical feet

Model Number	Dimensions - Inches (mm)			Weight lb. (kg)
	Height	Width	Length	
R4400-503	3.75 (95)	6.3 (160)	9.0 (221)	4.3 (2)
R4400-504	3.75 (95)	6.3 (160)	10.3 (252)	6.3 (3)

Model Number	Supply Voltage	Amp Draw 12V (24V)	Max Fuse	Flow GPM (LPM)	Sensor Pressure	Shut-Off Pressure	Inlet Strainer
R4400-503	12-24V DC	8.0 (4.0)	15A	3.7 (13.5)	25 psi (1.7 bar)	35 psi (2.8 bar)	Yes
R4400-504	12-24V DC	12.0 (6.0)	15A	4.5 (16.3)	30 psi (2.1 bar)	40 psi (2.8 bar)	Yes

#### OPERATION

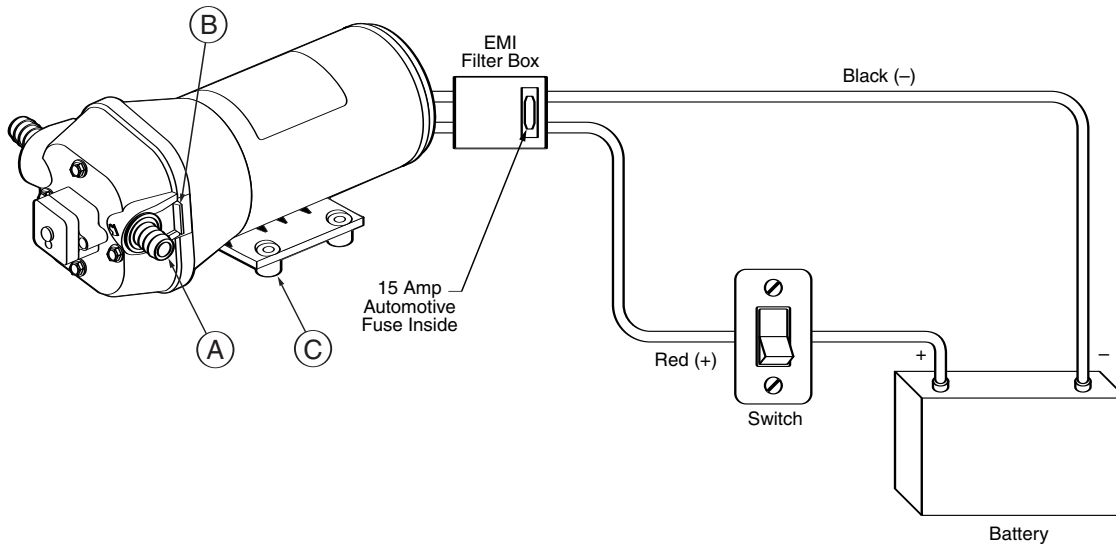
Mount the pump in a dry, ventilated location. The inlet strainer must be installed between the liquid supply and the pump inlet port.

**IMPORTANT:** Polarity of electrical connections is very important. Insure that the RED (+) motor lead is connected to a fused positive DC circuit. The BLACK (-)

motor lead must be connected to the negative DC circuit. In the event that polarity is reversed, fuse found in the "EMI Filter Box" must be replaced.

To prime the plumbing system, open pump outlet and turn power on to the pump. Allow pump to run until liquid is free of air.

## INSTALLATION AND WIRING DIAGRAM



**⚠ WARNING** Do not operate pump where flammable vapors are present. Do not pump gasoline or other flammable liquids.

**⚠ CAUTION** Do not freeze pump. Purge with air or anti-freeze to winterize.

**⚠ WARNING** Turn power off to pump and drain system before servicing. Use chemicals in strict accordance with manufacturer's label, cautions, and directions. Take precautions to prevent injury in case of a pump leak.

### INSTALLATION

1. Remove the shipping plugs from the pump ports. Some water from factory testing may spill out.
2. Install port adapter(s) A and/or strainer as required. Firmly push B slide clips forward to lock adapter(s) and/or strainer in place.
3. Push the four rubber grommets C into base plate mounting holes.
4. Mount pump horizontally, or vertically with the pump head lower than the motor. Any plumbing leak should not drip on the motor.
5. 3/4" ID hose may be used (preferably braided or reinforced) to isolate pump from plumbing system. 1/2" ID hose may be used on 3.5 GPM model. Use hose clamps on hose barb connector.

### WIRING

Automatic Variable Speed Motor Driven Pumps will operate in either a 12 or 24V DC system. The unique electronics adjust the voltage and current to the motor as needed.

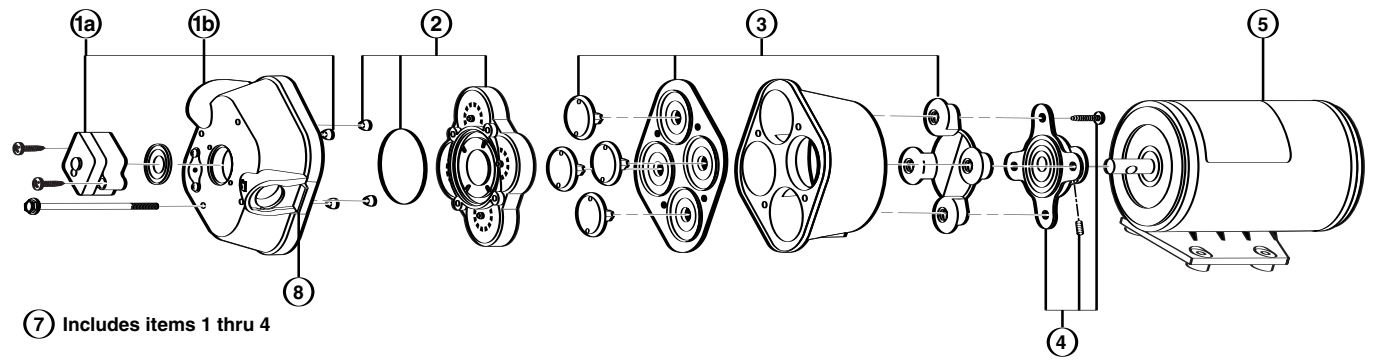
1. Use 14 AWG stranded wire to 20 feet, 12 AWG to 50 feet from distribution panel or power source.
2. Install a 15 amp rated on-off switch on the positive (+) lead from the power source.
3. Use a 15A fuse breaker in the circuit at the distribution panel.

**⚠ CAUTION** Always wear eye protection. Flush pump with water or neutralizing solution after chemical use.

### DISASSEMBLY

1. Refer to exploded view. Remove cover and lift up clip (1a) to unplug the sensor. Remove sensor housing.
2. Loosen but do not remove the four pump head screws and carefully remove the upper housing assembly (1b).
3. Inspect the backflow valve beneath sensor for debris.
4. Change the four sealing ferrules.
5. Inspect the valves for debris and resilience.
6. Replace if necessary, see Step 4 above.
7. Remove rubber plugs to expose notches. Rotate the lower housing (4) so notch opening exposes set screw that holds bearing housing to motor shaft.
8. Loosen the set screw with an 1/8" Allen wrench inserted through the notch opening. Finally, slide lower housing (4) off motor shaft.
10. Test motor by carefully connecting red wire to positive (+) and black wire to negative ground (-) of a 12 or 24V DC battery. Motor will run full speed and slow as sensor is brought closer to magnet's south pole. Replace if necessary.

## EXPLODED VIEW



## PARTS LIST

Key	Description	R4400-503 Kit Number	R4400-504 Kit Number
0	Service Kit*	20409-043	20409-043
1	Upper Housing (1b) with Sensor Housing (1a)	20404-027	20404-028
2	Check Valve Assembly	20407-030	20407-030
3	Diaphragm Assembly (includes screws)	20403-040	20403-040
4	Cam/Bearing Kit	20400-003	20400-003
5	Motors with Sensor	R2009-157A	R2009-158A
7	Pump Head Assembly	20406-037A	20406-038A
8	Side Clips (pair)	20408-000	20408-000

\* Service Kit includes #2, #3, #8 and drive cam assembly.

## REASSEMBLY

- Assemble diaphragm and lower housing per the following:
  - Insert four black inner piston stems through four holes in diaphragm.
  - Fold white outer piston to insert into lower housing.
  - Hex stem of inner pistons must align with hex holes in outer pistons.
  - Outer pistons must be aligned with alignment slots on the cam bearing assembly.
  - Drive piston screws partially tight then, carefully center each piston in its quadrant, and tighten the screws to 18 in. lbs. torque.
- Attach lower housing to motor shaft by aligning indentation in shaft with set screw. Set screw must align with the shaft indentation or major damage, poor performance, or high amp draw may result.
- View the inside of the upper housing (1b) and seat the four ferrules in the pump head screw recesses.
- Carefully seat the O-ring in the check valve assembly. O-ring must not slip out of the check valve recess.
- Install check valve assembly into upper housing, pressing firmly. Start the four pump head screws, turning by hand through the ferrule seals, then push through about 1 1/2".
- Assembly on to lower housing (4), align four screws to motor by rotating lower housing if necessary to align feet.
- Tighten pump head screws evenly (30 in. lbs. torque).
- Place sensor housing (1a) and sealing disk against upper housing (1b), insert screws and take care not to cross thread or strip out threads in upper housing.
- Slide the sensor under the clip until it engages in the sensor housing, and install the cover.

## TROUBLESHOOTING

### Problem

### Solution

#### Failure to prime-motor operates, but no pump discharge

- Debris in pump
- Defective check valve assembly
- Air leak in intake line
- Restricted intake or discharge line
- Punctured diaphragm (pump leaks)
- Crack in pump housing (pump leaks)
- Empty water supply tank

Remove upper housing and clean  
 Replace check valve assembly  
 Tighten all clamps, inspect plumbing  
 Remove lines and inspect  
 Replace lower housing assembly  
 Replace housing or pump head  
 Refill or turn power off to pump

#### Motor fails to run

- Pump circuit has no power
- Loose or corroded wiring connection
- Blown fuse or open breaker
- Open thermal protector (motor shell hot)
- Defective motor, drive control or pressure sensor

Check wiring, fuse or breaker  
 Inspect wire connections  
 Replace or reset  
 Wait 20 to 30 minutes for auto reset  
 Contact factory, 1-949-609-5106

#### Pump fails to turn off after all fixtures are closes

- Empty water supply tank
- Air trapped in pump
- Debris in pump
- Defective check valve assembly
- Punctured diaphragm (pump leaks)
- Discharge line leak

Refill  
 Open faucet closest to pump  
 Remove upper housing and inspect  
 Replace check valve assembly  
 Replace lower housing assembly  
 Inspect plumbing and fixtures for leaks

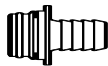
#### Low flow or pressure

- Debris in inlet strainer
- Water filter needs charging
- Undersize plumbing or long runs
- Defective motor, drive control or pressure sensor

Remove cover and clean screen  
 Replace filter cartridge  
 Increase plumbing ID  
 Contact factory, 1-800-2FLOJET

## ACCESSORIES

### Quick Connect Port Fittings



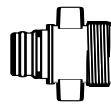
20381-015

QUAD PORT x  
 1/2" HOSE BARB  
 STRAIGHT  
 Viton O-ring



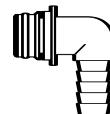
20381-014

QUAD PORT x  
 3/4" HOSE BARB  
 STRAIGHT  
 Viton O-ring



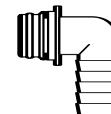
20381-032

QUAD PORT x  
 GARDEN HOSE  
 STRAIGHT  
 Viton O-ring



20381-017

QUAD PORT x  
 1/2" HOSE BARB  
 90° ELBOW  
 Viton O-ring



20381-018

QUAD PORT x  
 3/4" HOSE BARB  
 90° ELBOW  
 Viton O-ring



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THE PRODUCTS DESCRIBED HEREIN ARE SUBJECT TO THE STANDARD FLOJET ONE YEAR LIMITED WARRANTY, WHICH IS AVAILABLE FOR YOUR INSPECTION UPON REQUEST.

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