

### INSTALLATION & SERVICE INFORMATION

#### DESCRIPTION

FLOJET Industrial Duplex II Pumps are designed for a wide range of applications and are constructed from a selection of materials suitable for handling a broad range of chemicals. The Duplex II series of diaphragm pumps are self-priming and can be run dry without harm. They are intended for intermittent duty cycles but can be run continuously for short periods of time. The higher the duty cycle the shorter the expected life of the pump.

Typical pump uses are liquid transfer, spraying, cooling, circulation, filtration and dispensing.

#### OPERATION

To start and prime the pump, the discharge line must be open allowing trapped air to escape thus avoiding the potential of airlock. The pressure switch will shut off the pump automatically when the discharge valve is closed and the pressure has risen to the switch OFF set point. The pressure switch will restart the pump when a valve is opened and the discharge line pressure drops to the ON set point of the pressure switch.

#### DEMAND OPERATION (INTERMITTENT DUTY)

Demand Operation is considered an "intermittent duty" application. The maximum intermittent duty cycle is that which will cause the motor to reach its maximum thermal limits. Once the maximum thermal limit is reached, the motor must be allowed to settle to a lower temperature ideally being ambient before resuming operation. Running the pump at or near the maximum thermal limit for extended period of time will shorten the life of the pump and may result in immediate pump failure.

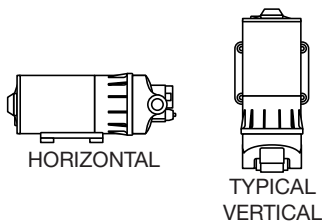
#### BYPASS OPERATION (IF EQUIPED)

Models equipped with an external bypass system are designed to pump at high pressures while at low or high flow rates. Models equipped with a bypass only will continue to run until the power is manually turned off.

The Duplex II pumps are not recommended for continuous duty service due to limited motor brush life. Operation at lower pressures and temperatures, however, will extend overall pump service life.

#### MOUNTING

The FLOJET Duplex II Series pumps are self-priming. Vertical prime may vary depending on the fluid viscosity, suction tube size, foot valve and pump configuration. The pump should be mounted in a dry and adequately ventilated area. If mounted within an enclosure, provisions to cool the motor may be necessary.



#### PREVENTATIVE MAINTENANCE TIPS

If pumping a liquid other than water the pump should be flushed with water (if applicable) after each use.

Sealers and Teflon tape acting as a lubricant can cause cracked housings or stripped threads due to over tightening. Care should be used when applying sealers; the tape may enter the pump inhibiting valve action, causing no prime or no shut-off conditions. Failures due to foreign debris are not covered under warranty.

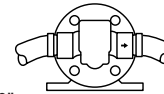
Before freezing conditions occur, the pump must be liquid free or winterized with proper anti-freezing chemicals.

If mounting the pump in an outdoor environment the pump should be shielded from water, dust, sunlight and wash down spray.

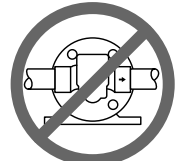
Do not assume chemical compatibility. If the fluid is improperly matched to the pumps Elastomers, the pump may fail to prime, have low pressures or the pressure switch may not shut off.

#### PLUMBING

Use flexible hose of the correct pressure rating that is compatible with the fluid to be pumped. Tubing should be a minimum of 3/8" (9.5 mm) ID and at least 20 inches (508 mm) in length to avoid excess stress on the pump ports. Do not crimp or kink the tubing. The pump head maybe rotated in 90° increments to simplify plumbing.



FLEXIBLE HOSE



RIGID PIPE

FLOJET does not recommend the use of metal fittings, standard plastic male and female threaded fittings can be acquired at commercial plumbing supply stores. FLOJET also distributes plastic barb fittings through our distributors (form no. F100-001).

The use of check valves in the plumbing system could interfere with the priming ability of the pump. If a check valve is installed in the plumbing it must have a cracking pressure of no more than 2 PSI (.14 bar).

Use of a minimum 40-mesh strainer or filter in the pump inlet line will prevent foreign debris from entering the system. Failures due to foreign debris entering the pump will not be covered under the limited warranty.

Note: Inlet pressure must not exceed 30-PSI (2.1 bar) maximum.



#### WARNING



#### Risk of an electrical shock!

When wiring electrically driven pumps, follow all electrical and safety codes, as well as the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

Make certain the power source conforms to the pump voltage. Be sure all power is disconnected before installation.

The pump should be wired into an individual (dedicated) circuit, controlled with an UL/C-UL certified double pole switch rated at or above the fuse ampere indicated on the pump motor label.

On 115-volt AC pumps, the black wire lead is live or common, the white lead wire is neutral and the green/yellow is ground. On 230-volt AC pumps the brown wire lead is live or common, the blue wire is neutral and the green/yellow is ground.

On 12 and 24 volt pumps the red lead is positive and should be connected to the battery plus (+) terminal. The black lead is ground and should be connected to the battery minus (-) terminal. Use T6 AWG wire minimum. Use a fuse to protect the system wiring and components.

Improper duty cycle and/or rapid start stop conditions caused by undersized spray nozzles will cause the internal thermal breaker (if equipped) to trip, or can cause premature motor failure due to excessive heat.



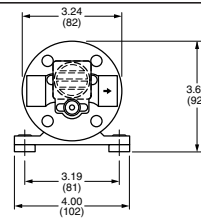
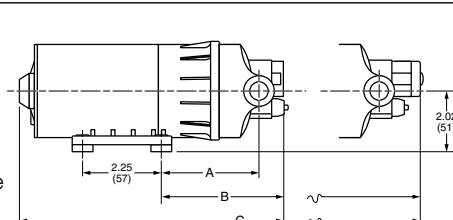
#### WARNING



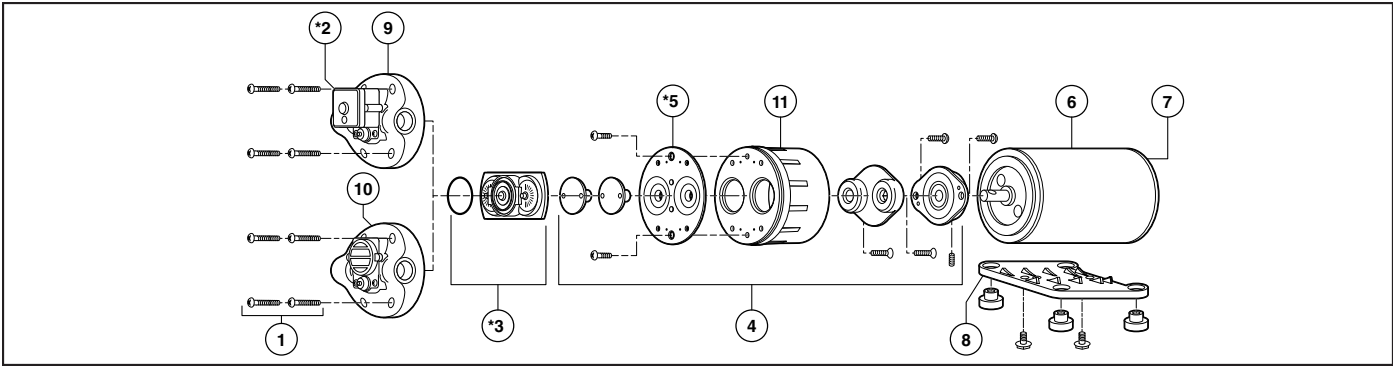
**DO NOT USE TO PUMP FLAMMABLE FLUIDS, GASOLINE, KEROSENE FUEL OIL, ETC. DO NOT USE PUMP IN A EXPLOSIVE ENVIRONMENT.**

#### DIMENSIONAL DRAWING

Inches (Millimeters)  
Dimensional tolerances  
± 0.06 inches  
Consult factory if precise  
details are required.



DEMAND PUMP	A	B	C
Minimum Dimension	2.53 (64)	3.98 (101)	8.00 (203)
Maximum Dimension	2.79 (71)	4.79 (122)	8.61 (219)
BY PASS PUMP			
Minimum Dimension	2.53 (64)	3.25 (83)	7.27 (185)
Maximum Dimension	2.79 (71)	3.51 (89)	7.73 (196)



KEY	DESCRIPTION	KEY	DESCRIPTION
1	Pump Screws	7	Motor Rear End Bell Assembly
*2	Pressure Switch Assembly	8	Base Plate/Grommet Assembly
*3	Check Valve Assembly (With O Ring)	9	Upper Housing (Switch By Pass)
4	Diaphragm/Cam Bearing Assembly	10	Upper Housing (By Pass Only)
*5	Diaphragm	11	Bearing Cover
6	Motor Assembly (Less Base Plate)	*SPARE PARTS AVAILABLE	

**DISASSEMBLE**

**Pump Housing (2)**

1. Disconnect power to the pump motor.
2. Remove pressure switch cover (2) and remove wire leads from switch assembly.
3. Remove the four recessed pump-housing screws (1) located on top of the pump housing (8 or 9).
4. Remove the pump housing (9 or 10) from diaphragm/lower housing assembly.

**Check Valve Assembly (3) – Follow steps 1 through 4.**

5. The check valve housing and o-ring (3) located in the upper housing (9 or 10) or on the diaphragm cam assembly (4).
6. If in upper housing, remove by placing a small flat blade screwdriver between the upper housing and check valve housing and pry out.

**Diaphragm/Cam Assembly (4)**

7. Remove two deep set phillips head screws (4).
8. Rotate bearing cover (11), so access notch is aligned with cam bearing set screw, loosen set screw with a 1/8" Allen wrench and slide pump lower housing assembly from motor shaft.
9. After removing the cam bearing from the outer piston set, the inner piston screws are now visible, remove both flat head screws. The outer piston set can now be removed from the two inner pistons.

**TROUBLESHOOTING**

**Failure to Prime - Motor operates, but no pump discharge**

- Restricted intake or discharge line. Open all line valves, check for "jammed" check valves, and clean clogged lines.
- Air leak in intake line.
- Punctured pump diaphragm.
- Defective pump check valve.
- Crack in pump housing.
- Debris in check valves.

**Motor Fails to Turn On**

- Pump or equipment not plugged in electrically.
- Loose wiring connection.
- Pressure switch failure.
- Defective motor or rectifier.
- Frozen cam/bearing.

**Pump Fails to Turn Off after Discharge valves are Closed**

- Depletion of available liquid supply.
- Punctured pump diaphragm.

**REASSEMBLE**

**Diaphragm/Cam Assembly (4)**

1. Place hex stem of inner pistons through the diaphragm and the openings in the bearing cover (11) and into outer piston set.
2. Center pistons in diaphragm and install two flat head screws.
3. Place cam bearing over outer piston set aligning locating pins into the holes of the cam bearing housing.
4. Install round head screws and tighten securely.

**Bearing Cover (11)**

5. Coat motor shaft with grease prior to installing the diaphragm/cam bearing assembly (4) to motor.
6. Attach cam bearing assembly to motor shaft by aligning shaft indentation with set screw and tighten securely. (Rotate access notches down toward the base plate.)
7. Install and tighten 2 phillips head screws to motor (torque to 25 inch pounds).

**Check Valve Assembly (3)**

8. Install check valve with new o-ring over the pistons in diaphragm, discharge side up (side with center circle up).

**Pump Housing (9 or 10)**

9. Place pump housing (9 or 10) over check valve and align the four screw holes with bearing cover.
10. Install the four phillips head screws (1) into the bearing cover and cross tighten securely.

- Discharge line leak.
  - Defective pressure switch.
  - Insufficient voltage to pump.
  - Debris in check valves.
- Low Flow and Pressure**
- Air leak at pump intake.
  - Accumulation of debris inside pump and plumbing.
  - Worn pump bearing (excessive noise).

- Punctured pump diaphragm.
- Defective rectifier or motor.
- Insufficient voltage to pump.

**Pulsating Flow - Pump Cycling On and Off**

- Restricted pump delivery. Check discharge lines, fittings, valves and spray nozzles for clogging or undersizing.

**SERVICE KITS**

Kits are readily available to repair standard Duplex II series pumps. To insure that the correct kits are received the model number and all name plate data must be included with the order. Contact a FLOJET distributor or FLOJET directly to order the necessary repair kits.

**RETURN PROCEDURE**

Prior to returning any product to Flojet, call customer service for an authorization number. This number must be written on the outside of the shipping package. Place a note inside the package with an explanation regarding the reason for return as well as the authorization number. Include your name, address and phone number.



Engineered for life

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