

# DELANAV

# PowerFLO™

## Diaphragm Pumps

## FB2 Series



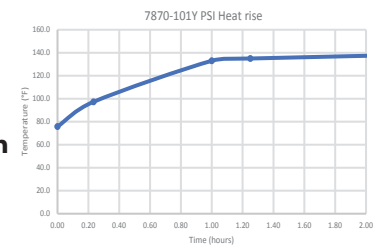
### Installation • Operation • Repair • Parts

#### Specifications

**Motor:**  
**Type:** 12 VDC permanent Magnet totally enclosed, non-ventilated.  
**Leads:** 12 AWG, 6" long  
**Duty Cycle:** See Heat Rise Graph  
**Temperature Limits:** Motor is not equipped with thermal protection. For user safety, optimal performance, and maximum motor life, the motor temperature should not exceed 180°F (66°C) (See heat Rise Graph).

**Pump**  
**Type:** 5 Chamber positive displacement diaphragm pump, self priming, capable of being run dry, demand or bypass.

**Liquid Temperature:** 140°F (60°C) Max.  
**Priming Capabilities:** 14 feet (2.5m)  
**Max Pressure:** 100 PSI  
**Inlet/Outlet Ports:**  
 7970 Series - Quick Attach Ports  
 7870 Series - 1/2" FNPT



#### Materials of Construction

**Housing:** Polypropylene  
**Diaphragm:** Santoprene & stainless steel  
**Valves:** Santoprene  
**Fasteners:** Stainless Steel  
**Weight:** 5.5 Lbs

#### Available Models

7870-101E-CE	FB2, 7GPM, DEMAND, THREADED PORTS, 12VDC, 60 PSI, RETAIL BOX, CE
7870-101E-SB	FB2, 7GPM, DEMAND, THREADED PORTS, 12VDC, 60 PSI, RETAIL BOX
7870-101E-SB-HS	FB2, 7GPM, DEMAND, THREADED PORTS, 12VDC, 60PSI, RETAIL BOX, HEATSINK
7870-101Y-CE	FB2, 7GPM, DEMAND, THREADED PORTS, 12VDC, 100PSI, CE
7870-101Y-SB	FB2, 7GPM, DEMAND, THREADED PORTS, 12VDC, 100PSI, RETAIL BOX
7870-111E-SB	FB2, 7GPM, BYPASS, THREADED PORTS, 12VDC, 60PSI, RETAIL BOX
7870-111E-SB-HS	FB2, 7GPM, BYPASS, THREADED PORTS, 60PSI, 12VDC, RETAIL BOX, HEATSINK
7870-111Y-CE	FB2, 7GPM, BYPASS, THREADED, 12VDC, 100PSI, CE
7870-111Y-SB	FB2, 7GPM, BYPASS, THREADED PORTS, 12VDC, 100PSI, RETAIL BOX
7970-101E-CE	FB2, 7GPM, DEMAND, QUICK ATTACH PORTS, 12VDC, 60PSI, RETAIL BOX, CE
7970-101E-SB	FB2, 7GPM, DEMAND, QUICK ATTACH PORTS, 12VDC, 60PSI, RETAIL BOX
7970-101Y-SB	FB2, 7GPM, DEMAND, QUICK ATTACH PORTS, 12VDC, 100PSI, RETAIL BOX
7970-111E-SB	FB2, 7GPM, BYPASS, QUICK ATTACH PORTS, 12VDC, 60PSI, RETAIL BOX
7970-111Y-SB	FB2, 7GPM, BYPASS, QUICK ATTACH PORTS, 12VDC, 100 PSI, RETAIL BOX

### Installation • Operation • Repair • Parts

**If you are having any issues with your Delavan Fluid Power Product please call 1-866-DELANAV and speak to our technical support team before returning to store. We are happy to help with any troubleshooting or product issues**

**Pressure Sensing Demand Switch:** (If equipped)  
 The PowerFLO Series Demand Pumps are controlled by a built-in pressure sensing demand switch. When a faucet or valve is opened down stream of the pump, line pressure drops thus starting the pump automatically. Conversely, when the valve shuts, the line pressure increases turning the pump off automatically. The pressure switch actuates in response to the pumps outlet pressure at a predetermined and preset pressure. The pump label indicates the predetermined OFF pressure. The OFF pressure is accurately set at the factory and the ON pressure is within an allowable range below that value. In response to the characteristics of the system in which the pump is installed, the flexibility and length of the tubing, the faucet or valves and the duration that they are open; these pressure settings may vary. Therefore, variations in pressure setting is expected with use over time. Caution: Improper adjustments of pressure switch can cause overload and may damage your pump. Please refer to ESR-001 on delavanfluidpower.com for instructions. Improper adjustments of pressure switch are not covered under Delavan's standard warranty for manufacturer's defect.

**Internal Bypass:** (If equipped)  
 The PowerFLO series bypass pumps are best used in an applications which involve normal and frequent starts/stops of the motor. Internal bypass models are designed to pump at high pressure while at low flow rates. Models equipped with a bypass will operate even though the discharge side has been stopped therefor models equipped with a bypass will continue to run until the power is turned OFF.

**Installation:**  
 The pump should be mounted in a dry place away from any sources of heat. If an enclosure is used, special instructions for cooling the motor may be necessary. Consult the factory.  
 Do not subject the pump to extreme high or low (freezing) temperatures while in operation. (Operating ambient temperature range is 32° to 115°F.)

**Plumbing:**  
 Use suction hose to inlet of pump. Use flexible tubing with proper pressure rating.  
 Pump will prime only if all pressure is relieved from the outlet port.  
 It is recommended that debris-free water be pumped or an in-line sediment filter (50 mesh) be installed at the inlet side to keep foreign debris out of the system.  
 Avoid using any sharp bends which may crimp tubing or restrict flow. Use 90° fittings if necessary.  
 The pump should always be mounted prior to any components which could introduce particles into the water, thus preventing them from entering the pump chambers and causing clogging.

**Electrical:**  
 Ensure Power supply used is adequate for the application.  
 Pump ratings are based on alternator charged battery which supplies 13.7 volts.  
 Voltage drop will result in reduced motor speed thus reducing performance. Higher operating flow and pressures increase amp draw.

### Installation • Operation • Repair • Parts

**Precautions:**  
 Do not operate pump in an explosive environment. Arcing from the motor brushes, switch or excessive heat from an improperly cycled motor may cause an explosion.  
 Do not place the pump motor near low temperature plastics or combustible material. The surface temperature of the motor may exceed 250°F (120°C).  
 Do not pump gasoline or other flammable liquids. Pump head materials are designed for use with water only.  
 Pump head materials are designed for use with water based products only. NEVER use with petroleum based products.  
 To prevent electrical shock, disconnect power before initiating any work. In the case of pump failure, the motor housing and/or pump fluid may carry high voltage to components normally considered safe. Therefore, always consider electrical shock hazard when working with and handling electrical equipment. If uncertain, consult an Electrician. Electrical wiring should only be done by a qualified electrician per local and state electrical codes.

- Operation:**
1. Turn off water supply.
  2. Cut flexible tubing in sufficient length to avoid any stress on the tubing where it connects to the pump or the fitting on any accessory.
  3. Insert tubing into pump ports. If fittings are John Guest type, be sure tubing is inserted past the resistance point until it bottoms out against the port stop. If compression fittings with threaded nuts are used, insert tubing until it bottoms out in the port and hand tighten the compression nut until the connection is tight. Then use a wrench to tighten the nut 1/2 turn clockwise or follow the wrench tightening instructions provided by the fitting manufacturer.
  4. The pump is now ready for operation. Turn on water supply valve to allow water to flow to the pump. If the power source is a transformer, plug the appropriate supplied/approved transformer into the receptacle and connect the pump to the transformer. If the power source is not a transformer, connect the pump to the appropriate power source. Open the discharge or dispensing valve. Allow water to circulate, purging any entrapped air. The pump will now start building pressure. Operating pressure will vary with flow rate, flow valve, feed-water pressure and line voltage. Check for fitting leaks.
  5. If compression fittings with threaded nuts are used, observe any leaks after pump has run for approximately 15 minutes. Further tighten compression nuts approximately 1/8 to 1/4 of a turn on all fittings in the system. Wait 15 minutes and repeat the leak check. Note: Further adjustments should not be necessary although it may take several days of operation before all the air has been purged and the system is stabilized.

**Service and Maintenance:**  
 Once per year owners should check against operating standards.  
 Every 2-3 years inspect and/or replace lower housing (diaphragm).  
 Every 5 years inspect and/or replace valves.

**Winterizing and Pump Storage**  
 Before winterizing or storing pumps not in use for extended periods, Delavan Fluid Power recommends;  
 1. Run fresh water through pumps for 90 seconds to flush any residual chemicals from pump head.  
 2. Pump RV antifreeze through pump for 30 seconds.  
 3. Always store pumps indoors in a clean, dry, and vibration-free environment. Preferably in a cabinet or closed storage area that is free of insects and airborne debris.  
 4. Store pump in climate controlled environment above freezing temperature.  
 5. If in storage for longer than 3 months, turn pump on intermittently for 30 seconds. Periodically turning on pump prevents the grease in bearings from settling on one side and wear.

## TROUBLESHOOTING

### My Pump will not start:

- Check all electrical connections, fuses, breakers and wires powering the pump. If you are unsure about how to check components contact a qualified technician.
- Check wire leads and connection located on the pressure switch.
- Test Pressure Switch: Instructions on how to test pressure switch can be found on our website and YouTube. If pressure switch failure please call 1-866-DELAVAN.
- Rectifier or Motor for open or ground circuit.

### Pump will not Prime (no discharge with motor running)

- Most common reason for pump not priming is an air leak in your system. From the suction side of your pump ensure that all o-rings are in place and all clamp are air tight. Ensure there are no holes in your hoses.
- Examine all filters and strainers. Replace any that are clogged with debris.
- Remove hoses and check for clogs or obstructions by running water through.
- Increase suction hose size to slightly larger than the outlet or discharge side of pump.
- Check Pump Housing for cracks.

### Pump will not shut off

- Most common reason is air trapped in the outlet or discharge side or head of pump head. Disconnect hoses, drain lines and reconnect.
- Check for correct voltage to pump
- Check for debris or blockages in hose and inlet/outlet valves.
- Check for loose drive assembly or pump head screws.
- Adjust set screw on top of pressure switch using a 1/16" Allen Key. Rotate clockwise to increase pressure and counter clockwise to decrease pressure.

### Pump leaks from pump head or switch

- Check for loose screws or bolts around pressure switch and pump head.
- Check for punctured or torn diaphragm.

### Pump is Cycling (Rapidly turning on and off.)

- Pump cycling is always caused by more flow than the application allows. To fix:
- Add a bypass valve or 'return to tank' valve into your spraying system
- Increase the flow of your system with larger nozzles.
- Decrease pressure on pressure switch. Warning: Refer to ESR-001 on delavanfluidpower.com for instructions. Improper adjustments of pressure switch are not covered under Delavan's standard warranty for manufacturer's defect.

## Dimensions and Product Specifications

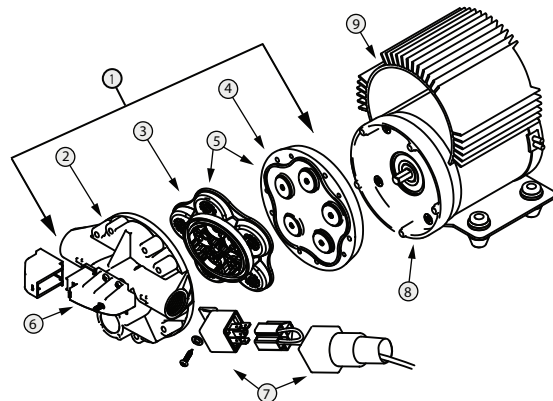
For more information about our products including dimensions, flow and pressure rates please visit our website at [www.delavanfluidpower.com](http://www.delavanfluidpower.com).

For more information about our FB2 series pumps scan the QR code with your smartphone or visit [www.delavanfluidpower.com](http://www.delavanfluidpower.com) and view the FB2 Product brochure.



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## Replacement Parts



Item	Description	Part Number
1	PUMP HEAD ASSEMBLY, THREADED PORTS, 7870, FB2, BYPASS	PHA-7870-B
	PUMP HEAD ASSEMBLY, THREADED PORTS, 7870, FB2, PRESSURE SWITCH	PHA-7870-PS
	PUMP HEAD ASSEMBLY, QUICK ATTACH PORTS, 7970, FB2, BYPASS	PHA-7970-B
	PUMP HEAD ASSEMBLY, QUICK ATTACH PORTS, 7970, FB2, PRESSURE SWITCH	PHA-7970-PS
2	UPPER HOUSING, FB SERIES, BYPASS, QUICK ATTACH PORTS	UHA-7900-B
	UPPER HOUSING, FB SERIES, DEMAND, QUICK ATTACH PORTS	UHA-7900-PS
	UPPER HOUSING, FB SERIES, BYPASS, THREADED PORTS	UHA-7800-B
	UPPER HOUSING, FB SERIES, DEMAND, THREADED PORTS	UHA-7800-PS
3	VALVE HOUSING, 7870/7871, FB2/FB3	VHA-7870
4	LOWER HOUSING ASSEMBLY, 7870/7970, FB2	LHA-7870
5	VALVE PLATE/LOWER HOUSING ASSEMBLY, 7870/7970, FB2	VLA-7870-RT
6	PRESSURE SWITCH ASSEMBLY - 7800/5800 SER (Demand Pumps Only)	7800-PSW-100
7	FB SERIES RELAY W/HEAT SHRINK BOOT (Demand Pumps Only)	FBR-102
8	MOTOR, FB2/FB3, NO SWITCH, NO CONNECTOR	M12-7870A
9	HEATSINK - 3.75 X 3.95 DIA, FB Series (Optional)	50-126

## Warnings

Please read and follow operators manual before using and installing Delavan Fluid Power products.

- Do not use pump outside the parameters listed on the label.
- Never use the pump above 100 PSI at anytime.
- NEVER pump gasoline or other flammable liquids. Pump head materials are designed for use with water based products only. NEVER use with Petroleum based products.
- Do not use in an explosive environment. Arcing from the motor brushes, switch, or excessive heat from an improperly cycled motor may cause an explosion.
- Do not assume fluid compatibility. If the fluid is improperly matched to the pump head, internal damage may occur.
- Always consider electrical shock hazard when working with and handling electrical equipment. If uncertain, consult an Electrician. Electrical wiring should only be done by a qualified electrician per Local and State Electrical Codes.
- Pump to be run between 32°F (0°C) and 115°F (46°C) environmental conditions. Maximum fluid temperature run through pump is 140°F (60°C).
- To prevent electrical shock, disconnect power before initiating any work. In the case of a pump failure, the motor housing and/or pump fluid may carry high voltages to components normally considered safe. Therefore, always consider electrical shock hazard when working with and handling electric equipment. If uncertain consult an electrician. Electrical wiring should only be done by a qualified electrician per local state electrical codes.
- Do not locate the pump motor near low temperature plastics or combustible material. The surface temperature of the motor may exceed 250°F.
- The installation of a 50 mesh strainer is recommended to prevent debris or other foreign material from entering the pump and causing pump failure.
- Delavan Pumps are designed for intermittent duty, but may run continuously if the motor temperature does not exceed the recommended limit.
- Always inspect pump before each use as directed. Do not use pump if damaged and not in working condition.
- Always assess work area for any hazards before using pump.
- Always understand the hazards of any chemicals used in you pump. Proper personal protective equipment should be worn and Safety Data Sheet read.

If you are having any issues with your product please call 1-866-DELAVAN before returning to store. A Delavan Technician would be happy to assist you.

## DELAVAN STANDARD WARRANTY

Delavan AG Pumps warrants its products for a period of two (2) years for consumers and 90 days for commercial users. The warranty period begins on the date of manufacture or the purchase date (with proof of purchase). The warranty period is not extended if Delavan repairs or replaces the equipment.

This Delavan AG Pumps warranty will not apply to any subsequent owner or other transferee of the Equipment. Delavan AG Pumps warrants that any new Equipment will be free from defects in workmanship or materials under normal use, maintenance and service (rental use excluded). The Warranty Period is not extended if Delavan AG Pumps repairs or replaces the Equipment. Delavan is not affiliated with and will not honor any 3rd party warranty. This Limited Warranty does not apply to equipment that has been altered, changed, repaired or treated since its delivery, used equipment, damaged or depreciation due to normal wear and tear. This limited warranty does not apply to defects or damage due to failure to follow Delavan AG Pump's operator's manual, specifications or other written instructions, improper storage, operation, maintenance, application or installation of parts, defects or damage due to misuse, accident or neglect, "acts of God" or other events beyond Delavan AG Pump's reasonable control. Delavan AG Pump's warranty does not apply when damaged by accessories, attachments, tools or parts that were not manufactured by Delavan AG Pumps. If the returned product is found not to be defective under the conditions of this warranty, a charge will be made for repair or replacement. If the returned product is found not to be non-defective under the conditions of this warranty, customer is responsible for cost of labor and goods returned. Delavan AG Pumps reserves the right to charge \$90/hour labor on non-defective good.

The sole and exclusive obligation of Delavan AG Pumps under this or any implied warranty shall be to replace or, at its option, to repair, without charge, any product which is determined by Delavan AG Pumps to be defective in workmanship or materials after the product is returned to the Delavan AG Pumps factory, shipping costs prepaid. No credit shall be given for warrantable items. In no event shall Delavan AG Pumps be liable to any person for indirect or consequential damages or for injury or commercial loss resulting from any use or inability to use any Delavan AG Pumps product. Delavan AG Pumps expressly negates any other warranty, express or implied, including any warranty of merchantability or fitness for a particular purpose, or arising from any course of dealing or custom or usage of trade.

No person, including any dealer or representative of Delavan AG Pumps, is authorized to make any representation or warranty on behalf of Delavan AG Pumps in addition to or inconsistent with these provisions. Purchasers to whom these provisions apply agree to hold Delavan AG Pumps harmless from claims by their customers in excess of the obligations of Delavan AG Pumps expressly set forth herein.

### Return Policy

For the safety of our employees and handlers, all pumps must be flushed with fresh water for 90 seconds prior to shipping. Delavan AG Pumps reserves the right to request (M)SDS for all chemicals used within. Delavan AG Pumps reserves the right to dispose as scrap any product returned with unknown fluids. Delavan AG Pumps reserves the right to charge returnee for any costs incurred for chemical testing and disposal of unknowns. Please Include complete description of operation problem, such as how pump was used, symptoms of malfunction, etc. to help pinpoint the reason of breakdown.

- Find more helpful troubleshooting tips on our website at [delavanfluidpower.com/FAQ](http://delavanfluidpower.com/FAQ)
- If you are still having trouble with your pump, speak to a technician Toll-Free 1-866-DELAVAN (335-2826)
- Check out our Youtube Channel at [youtube.com](http://youtube.com) and search Delavan Fluid Power.
- Follow us on Facebook to stay up to date on whats happening at [Facebook.com/DelavanFluidPower](http://Facebook.com/DelavanFluidPower)

