



**Model 31765-0092  
& 31765-0094**

## **Dual Sensor Max™ VSD WATER PRESSURE SYSTEM**

### **AUTOMATIC TWO STAGE WATER SYSTEM WITH PUMPGARD STRAINERS**

IDEAL FOR PLEASURE AND COMMERCIAL BOATS WITH  
HIGH DEMAND REQUIREMENTS

#### **FEATURES**

- Maintains steady water flow up to 9 GPM (34 lpm)
- True sensor regulated water pressure
- Operates at a nominal 30 psi (2 bar) pressure
- Eliminates need for accumulator tank
- Self-priming – Runs dry without damage
- CSA Listed
- **CE** 93/68/EEC, IEC 60335-1, 89/336/EEC,  
ISO 8846, ISO 10133:2000
- Patent Pending
- Meets following standards:

**Motors meet USCG Electrical Regulation 183.410  
and ISO 8846 MARINE for IGNITION PROTECTION  
on gasoline powered vessels.**

#### **PRODUCT SPECIFICATIONS**

<b>Motor</b>	Permanent Magnet DC type Sensor based electronic speed control Double ball bearing armature
<b>Pump</b>	Positive displacement diaphragm type Four chamber design Built-in Hall-Effect pressure transducer
<b>Weight</b>	15.0 lbs. (6.8 kg)

#### **GENERAL INFORMATION**

The Jabsco Dual Sensor Max VSD is designed specifically for water pressure systems in boats and recreational vehicles. Using state-of-the-art electronic control. Patent pending circuitry reduces power consumption and noise at low flow rates and eliminates the need for a bulky accumulator tank. Pump cycling and water hammer are virtually eliminated.

- The Dual Sensor Max VSD should be wired to the power supply through a switch rated for 25 amps.



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**TO AVOID SERIOUS OR FATAL PERSONAL  
INJURY OR MAJOR PROPERTY DAMAGE, READ  
AND FOLLOW ALL SAFETY INSTRUCTIONS IN  
MANUAL AND ON PUMP.**

**⚠ DANGER** Warns of hazards that **WILL** cause serious personal injury, death or major property damage.

**⚠ WARNING** Warns of hazards that **CAN** cause serious personal injury, death or major property damage.

**⚠ CAUTION** Warns of hazards that **CAN** cause personal injury or property damage.

**NOTICE** Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

**Important:** Indicates special instructions which are very important and must be followed.

**THIS MANUAL MUST BE KEPT WITH THE PUMP.  
MAINTAIN SAFETY LABELS.**

Model Number	Voltage VDC	Amp Draw (System)	Fuse Rating (Each Pump)	Flow Rate GPM (lpm)	Regulated Pressure	Cut-out Pressure	Inlet Strainer
31765-0092	12	20A	15A	9GPM (34 lpm)	30 psi (2 bar)	40 psi (2.75 bar)	Yes
31765-0094	24	10A	7A	9GPM (34 lpm)	30 psi (2 bar)	40 psi (2.75 bar)	Yes

**⚠ WARNING**

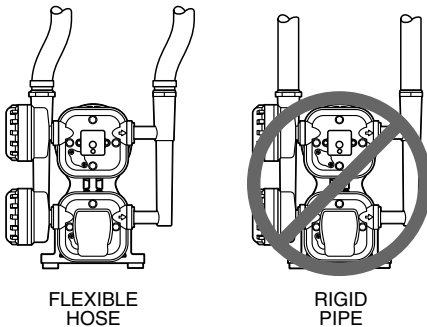
**Explosion hazard. Do not pump gasoline, solvents, thinners or other flammable liquids. To do so can cause an explosion resulting in injury or death.**

## INSTALLATION

### MOUNTING

Dual Sensor Max VSD system is self-priming and may be located up to 5 feet (1.5m) above the fresh water tank in a dry location. Note: vertical prime can vary depending on the fluid viscosity, suction tube size, use of a foot valve, and pump configuration. If mounted inside an enclosure, provide adequate ventilation for cooling.

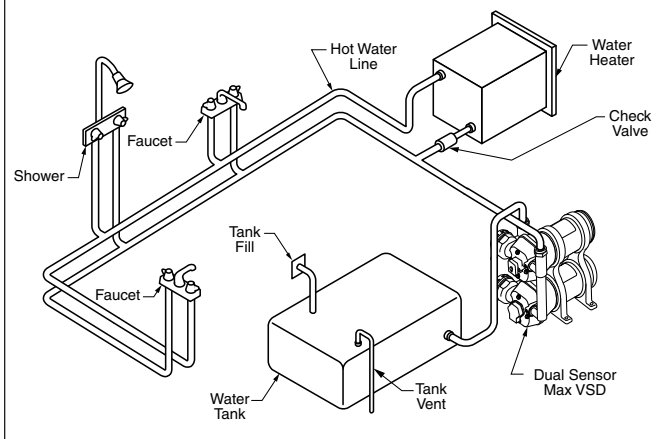
Install four rubber grommets in pump bracket mounting holes. The Dual Sensor Max VSD bracket is designed to mount on a flat surface with four mounting screws of adequate size. Do not mount to a vertical surface. Excessive strain caused by vertical mounting may cause failure of the mounting bracket. Do not over tighten mounting screws. Rubber grommets act as shock absorbers. Tighten mounting screws until rubber grommets are partially compressed. Over-tightening can cause excessive noise and vibration in the plumbing system.



### PLUMBING

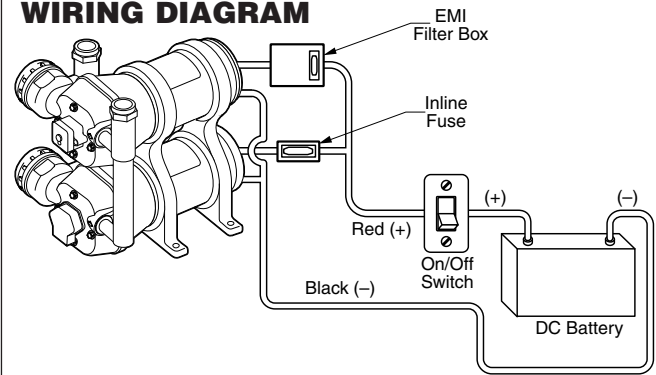
Use flexible hose and plastic fittings of correct pressure rating and compatible with the fluid being pumped. Tubing should be a minimum of 3/4" (19 mm) inside diameter to provide free flow and be secured with stainless steel clamps at each fitting. Do not connect pumps directly to rigid pipe. Rigid pipe will amplify pump noise and may fatigue and break plastic inlet and outlet fittings causing pump to leak. Periodically clean PUMPGUARD strainers. Avoid kinks in flexible plumbing.

### TYPICAL PLUMBING SYSTEM

**⚠ WARNING**

**Fire hazard. Wiring must comply with applicable electrical standards and include a properly sized fuse or circuit breaker. Improper wiring can cause a fire resulting in injury or death.**

## WIRING DIAGRAM

**NOTICE**

**When using a power supply or converter, a battery must be in the circuit for proper operation.**

### WIRING

Consult the WIRING DIAGRAM for proper circuit connection. The Dual Sensor Max VSD should be wired to the power supply through a switch rated for 25 amps. An inline fuse is factory installed in each pump to provide over current protection to each pump. The pump circuit should not include any other electrical loads. Red wire is positive. Black wire is negative. Turn the system off when not in use for extended periods or when supply tank is empty.

**IMPORTANT** VSD electronics require that a battery be installed in the DC power supply when using an AC to DC converter or battery charging system. Electrical noise from the converter or battery charging system can interfere with proper operation of the VSD circuit unless a battery is present in the DC power supply as shown in the WIRING DIAGRAM.

**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 the polarity is reversed on the VSD pump, the fuse found in the 'EMI Filter Box' built into the VSD power wire leads must be replaced.

**IMPORTANT** This system should be installed by a qualified electrician or someone familiar with applicable electrical and safety standards.

Use wire size according to the chart below. Total wire length refers to the distance from the DC power source to the pump and back to the power source. This chart provides for a maximum 3% voltage drop.

### WIRE SIZE TABLE

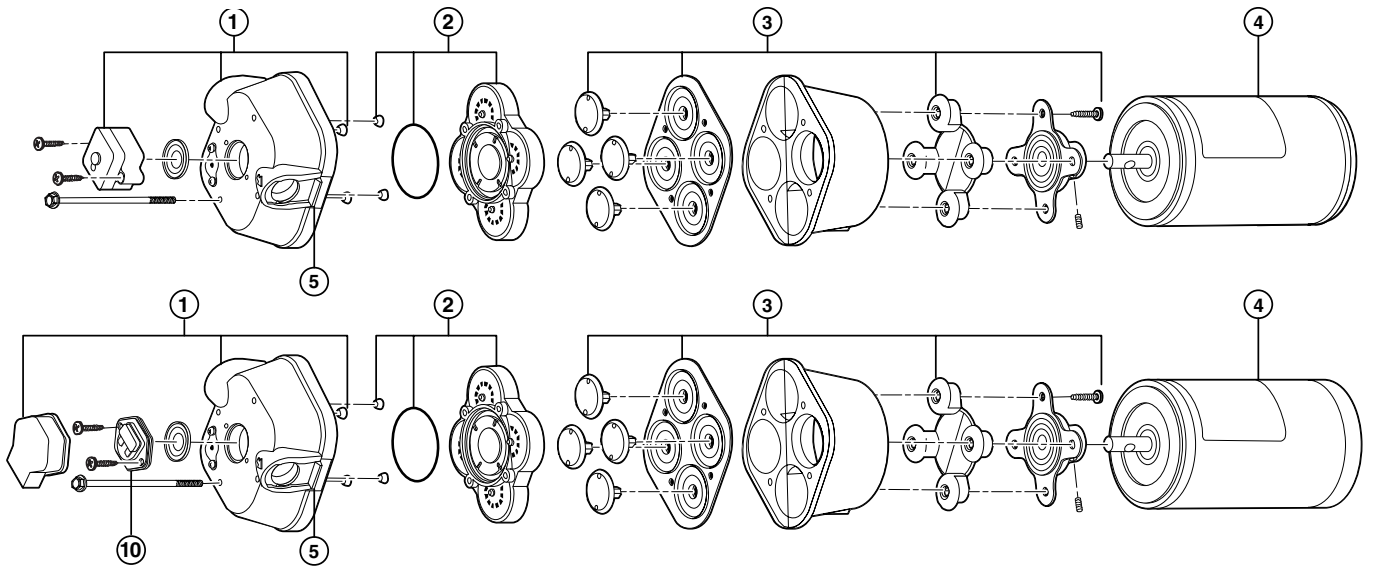
Total wire length	0-20 ft (0-6 m)	20-30 ft (6-9 m)	30-40 ft (9-12 m)	40-60 ft (12-18 m)
Wire	#10 AWG	#8 AWG	#6 AWG	#4 AWG
Size	(6 mm <sup>2</sup> )	(10 mm <sup>2</sup> )	(16 mm <sup>2</sup> )	(25 mm <sup>2</sup> )

**⚠ CAUTION** Motor case will get hot during extended operation. Prolonged contact with skin may cause a burn.

### PRE-OPERATION CHECKS

The supply tank should be at least half full prior to initial operation. Insure all plumbing connections are secure. Insure flexible tubing is not kinked. Insure all electrical connections are secure and in accordance with the WIRING DIAGRAM. Open all hot and cold water faucets and fixtures. Insure that water heater circuit is off.

## EXPLODED VIEW

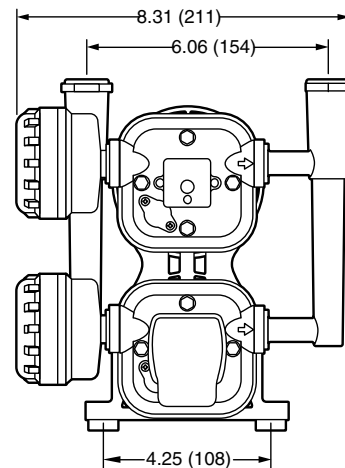
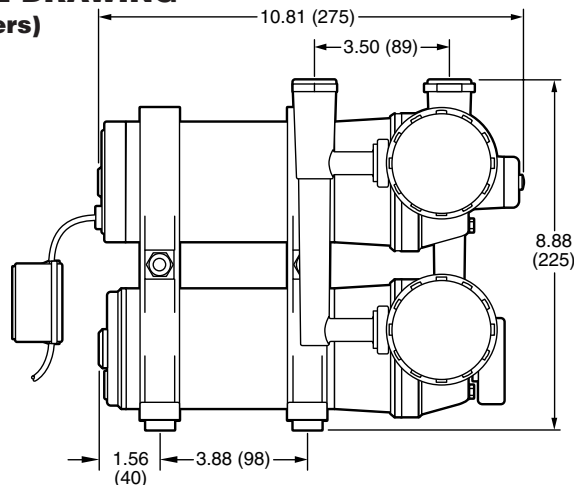


## PARTS LIST

Key	Description	31765-0092 (12V)	31765-0094 (24V)
1	Upper Housing Kit w/Sensor Housing (Top Pump)	18910-4028	18910-4028
1	Upper Housing Kit (Bottom Pump)	18910-4025	18910-4025
2	Check Valve Kit	18911-7030	18911-7030
3	Lower Housing Kit	18915-9002	18915-9002
4	Motor w/Sensor (Top Pump)	18919-0129	18919-0129
4	Motor (Bottom Pump)	18919-0136	18919-1057
5	Port Clips	30648-1000	30648-1000
Not shown	Pump Head Assembly (Top Pump)	18914-6038	18914-6038
Not Shown	Pump Head Assembly (Bottom Pump)	18914-6325	18914-6325
6	Manifold Kit	18753-0718	18753-0718
7	Bracket Kit	18753-0719	18753-0719
8	Strainer Kit	46400-9500	46400-9500
9	Port Fitting Kit	20381-073	20381-073
10	Pressure Switch (Bottom Pump)	18916-0025	18916-0025
*	Service Kit items 2, 3, 5	18920-9043	18920-9043

## DIMENSIONAL DRAWING

Inches (Millimeters)



## OPERATION

Switch the Dual VSD Pump System on and allow pump to prime. Turn each faucet and fixture off as flow becomes steady and free of air. Pump should shut off shortly after last faucet is closed. If pump does not turn off automatically, check for plumbing leaks and/or continue to bleed air from plumbing system.

Pump is now ready for automatic operation. It will start when faucet(s) open and stop when faucet(s) close. If pump will be inoperative for an extended length of time, turn pump circuit off and open a faucet momentarily to relieve system pressure.

**⚠ WARNING Remove electrical power from pump before servicing equipment.**

## SERVICE AND MAINTENANCE

Use only genuine Jabsco replacement parts. Insure power is removed from pump before service. Drain supply tank and/or pump system dry before disconnecting liquid fittings. Periodically clean PUMPGUARD strainers. Keep spare part kits on hand. Adhere to a preventive maintenance schedule and replace 'ware' parts before the end of their service life.

## DISSASSEMBLY

Refer to exploded view.

**PRESSURE SENSOR OR PRESSURE SWITCH** Remove cover in item 1. On VSD models, remove clip and unplug pressure sensor. On demand models, disconnect wire leads from terminals. Remove two mounting screws to release sensor/switch housing and diaphragm in figure 1.

**UPPER HOUSING** Remove four pumphead screws to release upper housing, item 1. Inspect backflow valve in sensor port for debris. Clean if necessary. Install new sealing ferrules in upper housing before re-assembly.

**CHECK VALVE ASSEMBLY** Remove o-ring and check valve assembly item 2 from pumphead. Valves should be clean and resilient. Replace if necessary. Always replace o-ring seal.

**LOWER HOUSING ASSEMBLY** Remove set screw item 4 in cam bearing assembly from motor shaft using an 1/8" Allen wrench. To access set screw, remove rubber plug from access hole in lower housing and rotate the lower housing until the access hole and set screw are in alignment. Always replace complete lower housing assembly including diaphragm, pistons, and cam bearing assembly.

**RE-ASSEMBLY** Re-assemble in reverse order. Rotate each screw counter clockwise and then clockwise during assembly to insure that self-tapping screws engage into original threads. Note: cutting new threads will diminish the strength of the thread engagement. Insure the set screw in item 3 is aligned with indentation on motor shaft. Tighten set screw to 35 in-lbs of torque. Tighten four piston screws to 18 in-lbs of torque. Tighten four pumphead screws to 30 in-lbs of torque. Sensor/switch screws should be hand tight. Do not over tighten.

## TROUBLESHOOTING CHART

PROBLEM/CAUSE	SOLUTION
<b>FAILURE TO PRIME OR PUMP</b> <ul style="list-style-type: none"><li>• Debris in check valve assembly</li><li>• Air leak in suction line</li><li>• Restricted suction line</li><li>• Supply tank is empty</li><li>• Ruptured diaphragm</li></ul>	Clean check valve assembly Tighten all fittings and clamps Clean strainer or remove kink in suction tube Fill supply tank Replace lower housing assembly
<b>MOTOR FAILS TO RUN</b> <ul style="list-style-type: none"><li>• Pump circuit has no power</li><li>• Loose or corroded wire connection</li><li>• Blown fuse or open circuit breaker</li><li>• Open thermal protector in motor</li><li>• Defective motor, drive, or sensor</li></ul>	Check main switch, wire, fuse or breaker Fix or replace wire connections Determine cause, reset breaker or replace fuse Turn power switch off, allow motor to cool Replace defective component
<b>PUMP FAILS TO TURN OFF</b> <ul style="list-style-type: none"><li>• Supply tank is empty</li><li>• Debris in check valve assembly</li><li>• No battery in circuit</li><li>• Leaking discharge line</li><li>• Leaking diaphragm or pumphead</li></ul>	Fill supply tank Clean or replace check valve assembly Install battery, replace VSD motor Tighten or replace leaking fitting or pipe Replace lower housing assembly
<b>LOW FLOW OR PRESSURE</b> <ul style="list-style-type: none"><li>• Blocked inlet strainer</li><li>• Blocked water filter</li><li>• Undersized plumbing or very long runs</li><li>• Defective motor, drive, or sensor</li></ul>	Clean strainer Replace filter element Increase plumbing to 3/4" inside diameter Replace defective component

Jabsco



**ITT Industries**  
*Engineered for life*

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

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