

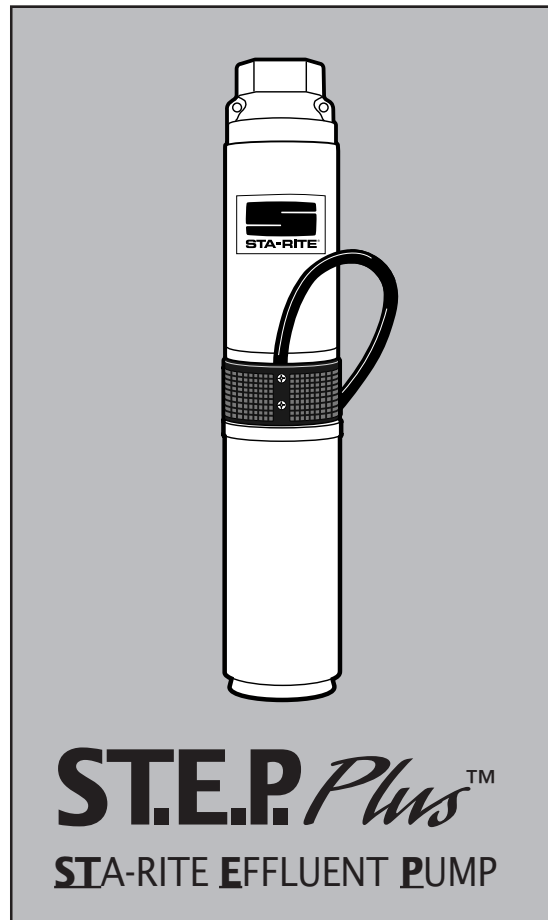
**STA-RITE®**

293 Wright Street, Delavan, WI 53115

OWNER'S MANUAL

## **4" Submersible High-Head Filtered Effluent Pump**

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### **Installation/Operation/Parts**


*For further operating, installation, or maintenance assistance:*


**Call 1-262-728-9181**


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
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Carefully read and follow all safety instructions in this manual or on pump.

 **This is the safety alert symbol.** When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury!


 **DANGER** DANGER warns about hazards that **will** cause serious personal injury, death or major property damage if ignored.


 **WARNING** WARNING warns about hazards that **can** cause serious personal injury, death or major property damage if ignored.


 **CAUTION** CAUTION warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.


The word **NOTICE** indicates special instructions which are important but not related to hazards.


To avoid serious or fatal personal injury and possible property damage, carefully read and follow the safety instructions.


-  **Hazardous pressure** Under certain conditions, submersible pumps can develop extremely high pressure. Install a pressure relief valve capable of passing entire pump flow at 75 PSI.

 Do not allow pump, piping, or any other system component containing water to freeze. Freezing may damage system, leading to injury or flooding. Allowing pump or system components to freeze will void warranty.

-  **Hazardous voltage** Can shock, burn or cause death. To avoid dangerous or fatal electric shock hazard, use pump only in an effluent system. DO NOT install pump in an open body of water ( a lake, swimming pool, etc.).

 Install, ground and wire pump according to local and Canadian Electrical Code or National Electrical Code requirements that apply.

 Disconnect electrical power supply before installing or servicing pump.

 Make sure motor nameplate voltage and frequency match line voltage and frequency of power supply.

- Install pump according to all plumbing, pump and well code requirements.
- Install an all leg disconnect switch in the power supply near the pump.
- Motors are equipped with automatic thermal overload protection which will open the circuit and stop the motor when a thermal overload (excessive heating) exists. When motor cools, overload will reset and motor will restart automatically. *This can cause the motor to start unexpectedly and without warning.*

## GENERAL

Inspect pump and motor for delivery damage. Report any damage immediately to shipping carrier or to Sta-Rite immediately.

Have any installation, repair, or service work done by your Sta-Rite dealer.

Never run pump dry.

**NOTE:** Install pump in the effluent or pumping chamber of vault — NOT in the sewage chamber. Pump is designed to pump filtered effluent or clear water only. It is not a sewage pump.

During system operation, pump must be submerged at all times.

Pipe joint compound can cause cracking in plastics. Use only teflon tape when sealing joints in plastic pipe.

Warranty is void in the following conditions:

- Water is highly corrosive.
- If entrained gas or air present in water being pumped reduce the flow and cause cavitation (which can damage the pump).
- Pump has been operated with discharge valve closed (severe internal damage will result).

## ELECTRICAL

### WIRING/GROUNDING



Can shock, burn, or cause death. Permanently ground pump, motor and control box before connecting power supply to motor.

Ground pump and motor in accordance with all codes and ordinances that apply. All wiring must meet National Electrical Code and Canadian Electrical Code (whichever applies). Use copper ground wire at least as large as wires carrying current to motor.

Motor is supplied with copper ground wire. Splice to copper conductor that matches motor wire size specified in Table 2. Use only copper wire for connections to pump.

Permanently ground pump and motor before connecting power cable to power supply. Connect ground wire to approved ground first, then connect to equipment being installed.

**Do not ground to a gas supply line.**

Float switches or any other approved motor control must match motor input in full load amperes.

For more information, contact your local code officials.

## INSTALLATION WIRING INSTRUCTIONS

### Single Phase, 2 Wire

2-Wire pumps have two power supply wires (Red/Black) and one ground wire (Green).

- Fasten power supply wire leads securely to pump discharge section; leave 4-5" of slack in leads at this point. Securely fasten leads to plastic pipe within 6" of the pump discharge section.
- Ground wire must be as large as wires supplying current to motor. Consult current National Electrical Code or Canadian Electrical Code (as applicable) and local codes for grounding information.
- Use only submersible power supply wires supplied by pump manufacturer. When installing pump, secure supply wires to discharge pipe with Scotch #33 electrical tape. DO NOT damage pump wires.

**NOTICE:** To avoid dropping pump or damaging wires or splices, NEVER allow pump wires to support weight of pump.

## EFFLUENT APPLICATIONS

Effluent applications must meet the following:



**Risk of electrical shock.** Do not remove cord and strain relief. Do not connect conduit to pump.

- Only qualified personnel should install the pump and associated control equipment.
- Vent sewage tank according to local code.
- Do not install pump in any location classified as hazardous by National Electrical Code, ANSI/NFPA 70-1984.
- These pumps are intended for permanent connection only. Provide strain relief at control box for power supply cord connection to box. All control components must be UL listed and suitable for end use application.

## PUMP INSTALLATION

- Make sure that pump and motor are free to rotate by turning the shaft by hand.
- To prevent dropping pump, lower it by the drop pipe, not by the cables. The electrical cables will not hold the pump weight.
- Discharge outlet is 1-1/4" NPT threaded.

**NOTICE:** Pump discharge is left-hand thread into pump shell. If installing external check valve, hold discharge with pipe wrench to prevent loosening discharge in shell.

4. If pump is to be operated with an open discharge, a discharge valve *must be installed.* Before startup, open this valve about 1/3 open. Start pump. *Slowly* open valve until the desired flow rate is reached. Final setting *must* be within pump's recommended operating range.

**OPERATION**

1. The pump must be submerged at all times during normal operation. **Do not run pump dry.**
2. Make sure that the float switches are set so that the pump stops before the pump runs dry or breaks suction. If necessary, adjust float switches to achieve this.
3. The motor bearings are lubricated internally. No maintenance is required or possible on the pump or the motor.

**Table 1: Recommended Fusing Data**  
60 Hz/1 Phase 2-Wire Cable

Motor Part Number	HP	Voltz/Hz/Phase	Motor Winding Resistance Ohms	Max Load Amps	Locked Rotor Amps	Fuse Size Standard/Dual Element
27342A191	1/2	115/60/1	1.0–1.3	12	64.8	30/15
P42B0005A1	1/2	115/60/1	1.4–1.7	9.5	36.4	30/20
P42B0005A2	1/2	230/60/1	4.6–5.6	4.7	19.5	15/10
P42B0010A2	1	230/60/1	4.2–5.2	9.1	21.7	25/15
P42B0015A2	1-1/2	230/60/1	1.9–2.3	11.0	42.0	35/20

**Table 2: Power Supply Wire (Cable) Length in Feet**  
1 Phase, 2 Wire Cable, 60 Hz (Copper Wire Size - Service to motor)

Motor Part No.	Volts	HP	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	4 AWG	3 AWG	2 AWG	1 AWG	0 AWG
27342A191	115	1/2	99	158	247	387	603	921	1138	1403	1677	1893
P42B0005A1	115	1/2	115	183	293	463	721	1150	1445	1825	2299	2902
P42B0005A2	230	1/2	466	742	1183	1874	2915	4648	5843	7379	9295	11733
P42B0010A2	230	1	241	383	611	968	1506	2400	3018	3811	4801	6060
P42B0015A2	230	1-1/2	199	317	505	801	1246	1986	2496	3153	3972	5013

**NOTE:** Sizes given are for copper wire. For aluminum wire go two sizes larger (i.e., if table lists #12 copper wire, use #10 aluminum wire.)

**Motor Insulation Resistance Readings**

Normal Ohm/Megohm readings for all motors, between all leads and ground. Set ohmmeter to 100K scale.

Condition of Motor and Leads	Ohm Value	Megohm Value
New motor, without power cable	20,000,000 (or more)	20.0
Used motor, which can be reinstalled in tank	10,000,000 (or more)	10.0
<b>Motor in Tank – Readings are Power Cable plus Motor</b>		
<i>Do not pull pump for these reasons:</i>		
New Motor	2,000,000 (or more)	2.0
Motor in reasonably good condition	500,000 to 2,000,000	0.5–2.0
Motor which may be damaged or have damaged power cable	20,000 to 500,000	0.02–0.5
<i>Pull pump; replace pump or cable:</i>		
Motor definitely damaged or with damaged power cable	10,000 to 20,000	0.01–0.02
Failed motor or power cable	Less than 10,000	0–0.01

**Important Electrical Grounding Information**



**WARNING** Hazardous voltage. Can shock, burn, or kill. To reduce the risk of electrical shock during pump operation, ground and bond the pump and motor as follows:

- To reduce risk of electrical shock from metal parts of the assembly other than the pump, bond together all metal parts accessible at the tank top (including metal discharge pipe, metal tank top, and the like). Use a metal bonding conductor at least as large as the power cable conductors running down the well to the pump's motor.
- Clamp or weld (or both if necessary) this bonding conductor to the grounding means provided with the pump, which will be the equipment-grounding terminal, the grounding conductor on the

pump housing, or an equipment-grounding lead. The equipment-grounding lead, when provided, will be the conductor having green insulation; it may also have one or more yellow stripes.

- Ground the pump, motor, and any metallic conduit that carries power cable conductors. Ground these back to the service by connecting a copper conductor from the pump, motor, and conduit to the grounding screw provided within the supply-connection box wiring compartment. This conductor must be at least as large as the circuit conductors supplying the pump.

**Save these instructions.**

## TROUBLESHOOTING GUIDE

PROBLEM	CHECK	CORRECTIVE ACTION
<b>Motor will not start but fuses do not blow</b>		
No voltage.	No voltage at disconnect switch. Electrical cable bad.	Replace blown fuses or bad cable, reset circuit breakers. Consult licensed electrician or serviceman.
<b>Fuses blow or overload protector trips when motor starts</b>		
Wrong size fuse, time delay fuse, or circuit breaker.	Check fuse or circuit breaker size against chart, Page 2.	Install correct fuse, time delay fuse, or circuit breaker.
Wire size too small.	Check wire size against chart, Page 3.	Install correct size wire.
Low or high voltage.	Check that line voltage is within $\pm 10\%$ of nameplate rated voltage while motor is running.	If voltage variation is greater than $\pm 10\%$ , call power company or local hydro authority to adjust voltage.
Pump or motor stuck or binding.	Check for locked shaft in pump.	If necessary, pull pump (make all possible above ground checks first). If pump is locked, replace it. Clean tank of all sand, lime, and solids before reinstalling pump.
Power supply wires or motor leads grounded, shorted, or open.	Consult licensed electrician or qualified serviceman.	Have a qualified serviceman or electrician make necessary cable repairs.
<b>Fuses blow or overload protector trips when motor is running</b>		
Low or high voltage.	Check that line voltage is within $\pm 10\%$ of rated nameplate voltage while motor is running.	If voltage variation is more than $\pm 10\%$ , call power company to adjust voltage.
High ambient (atmospheric) temperature.	Check temperature of tank	Protect tank from direct sunlight.
Wire size too small.	Check wire size against chart, Page 3.	Install correct wire size.
<b>Pump starts too frequently</b>		
Leaks in system.	Check plumbing for leaks.	
Level switch.	Check for defective switch or switch out of adjustment.	Re-adjust or replace level switch.
Check valves leaking.	Make sure check valves are not leaking back.	Replace check valves if necessary.
<b>Little or no water delivered</b>		
Check valve stuck.	Examine valve.	If stuck, free valve.
Low voltage.	Check voltage at circuit breaker with pump running. Check incoming wire size and power supply wire size against chart, Page 3.	Install larger wire from meter to circuit breaker. Install larger wire from circuit breaker to pump. If necessary, have power company raise supply voltage.
Plugged intake screen.	Pull pump and check condition of screen.	Clean or replace as necessary.
Check valve at pump discharge stuck.	Pull pump and examine check valve.	Free check valve.
Worn impellers and diffusers.	Make sure system is clear of obstructions and pump is in solid water and operating normally.	Replace pump.
Pump doesn't develop enough pressure ("head").	Check pump curve against operating conditions.	Replace pump with "higher head" pump.
Plugged impellers.	Pull pump.	Replace pump.

## LIMITED WARRANTY

STA-RITE warrants to the original consumer purchaser ("Purchaser" or "You") of the products listed below, that they will be free from defects in material and workmanship for the Warranty Period shown below.

Product	Warranty Period
Water Systems Products — jet pumps, small centrifugal pumps, submersible pumps and related accessories	<i>whichever occurs first:</i> 12 months from date of original installation, or 18 months from date of manufacture
Signature 2000® Fibrewound Tanks	5 years from date of original installation
Pro-Source Plus™ Fibrewound Tanks	5 years from date of original installation
Pro-Source™ Steel Pressure Tanks	5 years from date of original installation
Pro-Source™ Epoxy-Lined Tanks	3 years from date of original installation
Sump/Sewage/Effluent Products	12 months from date of original installation, or 18 months from date of manufacture

Our warranty will not apply to any product that, in our sole judgement, has been subject to negligence, misapplication, improper installation, or improper maintenance. Without limiting the foregoing, operating a three phase motor with single phase power through a phase converter will void the warranty. Note also that three phase motors must be protected by three-leg, ambient compensated, extra-quick trip overload relays of the recommended size or the warranty is void.

Your only remedy, and STA-RITE's only duty, is that STA-RITE repair or replace defective products (at STA-RITE's choice). You must pay all labor and shipping charges associated with this warranty and must request warranty service through the installing dealer as soon as a problem is discovered. No request for service will be accepted if received after the Warranty Period has expired. This warranty is not transferable.

STA-RITE SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE FOREGOING WARRANTIES SHALL NOT EXTEND BEYOND THE DURATION EXPRESSLY PROVIDED HEREIN.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on the duration of an implied warranty, so the above limitations or exclusions may not apply to You. This warranty gives You specific legal rights and You may also have other rights which vary from state to state.

This warranty supersedes and replaces all previous warranty publications.

**STA-RITE INDUSTRIES**  
293 Wright St., Delavan, WI 53115