

XE Series Pump Technical Training Guide





Hazardous voltage can shock, burn, cause serious injury and or death. To reduce the risk of electrocution and or electric shock hazards:

- Pump MUST be G.F.C.I. protected
- Should only be installed by qualified technicians
- Pump <u>MUST</u> be bonded properly

Suction Entrapment Hazard

Suction in suction outlets and/or suction outlet covers, which are damaged, broken, cracked, missing, or unsecured cause severe injury and/or death due to, but not limited to, the following entrapment hazards:

- Hair Entrapment
- Limb Entrapment

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- Evisceration/Disembowelment
- Mechanical Entrapment
- Body Suction Entrapment



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XE Series Pump How to Guide



How to: Install the XE Series Pump

- Locate pump as close to pool as possible, in compliance with local codes
- Suction lines should be as direct as possible to reduce friction loss
- Suction lines should have a continuous slope upwards from the lowest point in line
- Suction line must be equal to or larger than the discharge line diameter
- Though the pump is designed for outdoor use it is advisable to install the pump in a shaded area to shield them from continuous direct heat
- Pump should be installed in a well drained area that does not flood
- Do NOT install pump and filter in a non ventilated or damp location
- Pump motor requires free circulation of air for cooling
- Pump should be installed on a level concrete slab or rigid base that meets all local and national codes
- Secure pump to pad with screws or bolts to reduce vibration and stress on pipe or hose joints
- Base should be level, rigid, and vibration free

How to: Install the XE Series Pump (cont.)

- XE Pump inlet height to be as close to water level is possible
- Allow use of short, direct suction pipe to reduce friction losses
- Allow for valves in suction and discharge piping
- Be protected from excess moisture and flooding
- Allow adequate access for servicing pump and piping
- Refer to table below for Head Loss Information

Maximum Recommended System Flow Rate By Pipe Size			
Pipe Size In (mm)	Max. Flow Rate GPM (LPM)	Min. Straight Pipe Length "L" in. (mm)	
1 ½" (50)	45 (170)	7 ½" (190)	
2" (63)	80 (300)	10" (254)	
2 ½" (75)	110 (415)	12 ½" (317)	
3" (90)	160 (600)	15" (381)	





How to: Wire the XE Series Pump

- Pump/motor ships configured for 230vac
- Can be configured to operate at 115vac or 230Vac
- Input voltage must be within 10% of nameplate voltage to prevent overheating



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230Vac



*The XE pump comes pre-configured for 230Vac. For 230Vac applications wire the pump as shown above. 115Vac



*To convert the XE pump to operate on 115Vac, move voltage selection wire up to the 115Vac tab as shown above.

*Voltage jumper in 230Vac position with 115Vac applied will result in DC Voltage error. Voltage jumper in 115Vac position with 230Vac applied will result in permanent equipment damage

How to: Wire the XE Series Pump

- XE pumps <u>MUST</u> be grounded <u>AND</u> bonded
- All electrical wiring MUST conform to local codes and regulations as well as those found within the NEC
- XE pumps **MUST** be wired using a G.F.C.I. protected circuit



Bonding

Secure #8awg bonding wire to the bonding lug as required by the National Electrical Code.



How to: Recommended for 230vac Applications

Siemens QF220 20 Amp 2 Pole 240Vac GFCI



- ✓ *Plug in mounting style
- ✓ Class A 20 amp GFCI protection
- ✓ UL listed at 5 milliamp trip sensitivity
- ✓ 240Vac two pole circuit breaker

Square D Homeline HOM220GFI 20 Amp 2 Pole 240Vac GFCI



- ✓ *Plug in mounting style
- ✓ Class A 20 amp GFCI protection
- ✓ UL listed at 6 milliamp trip sensitivity

✓ 240Vac two pole circuit breaker

*The use of these circuit breakers can help reduce the occurrence of nuisance tripping of the GFCI

How to: Recommended for 120vac Applications

Siemens QF115P 15 Amp 1 Pole 120Vac GFCI



- ✓ *Plug in mounting style
- ✓ Class A 15 amp GFCI protection
- ✓ UL listed at 5 milliamp trip sensitivity
- ✓ 120Vac single pole circuit breaker

Square D Homeline HOM115GFICP 15 Amp 1 Pole 120Vac GFCI



- ✓ *Plug in mounting style
- ✓ Class A 15 amp GFCI protection
- ✓ UL listed at 6 milliamp trip sensitivity

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✓ 120Vac single pole circuit breaker

*The use of these circuit breakers can help reduce the occurrence of nuisance tripping of the GFCI

How to: Program the Daily Schedule

The XE Series Pump will operate on a 24 hour daily schedule which runs continuously and restarts every 24 hours. This 24 hour schedule is split into three (3) time intervals. Each time interval is programmable to one (1) of several different speeds. The default schedule from the factory is shown below:



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There are six (6) speeds available, plus **STOP**, on the XE Pumps. When programming the daily schedule, refer to this information:





The XE Series pump features simple, single button programming. The programming button is found at the rear of the motor as shown.



Press and hold button for four (4) seconds to enter programming mode. LED will rapidly flash three (3) times.



When power is applied and pump is in normal operation a solid green LED will be illuminated around the button.



Once in programming mode the LED will quickly flash one (1) time repeatedly. This indicates you are programming the speed for interval one (1).





Press and release the button the number of times needed to select the desired speed. The duration for interval one (1) is four (4) hours.



The LED will now begin quickly flashing two (2) times. This indicates you are programming the speed for interval two (2).



Once the speed for interval one (1) has been set, press and hold the button four (4) seconds. The LED will rapidly flash three (3) times.



Press and release the button the number of times needed to select the desired speed. The duration for interval two (2) is eight (8) hours.





Once the speed for interval two (2) has been set, press and hold the button four (4) seconds. The LED will rapidly flash three (3) times.



Press and release button the number of times needed to select desired speed. The duration for interval three (3) is twelve (12) hours.



The LED will now begin quickly flashing three (3) times. This indicates you are programming the speed for interval three (3).



Once the speed for interval three (3) has been set, press and hold the button four (4) seconds. The LED will rapidly flash three (3) times.





The LED will stop flashing and return to a solid on state. This indicates that programming of the pump is complete.



Use a time clock or relay to assure a consistent start time to the daily schedule.



The pump will now resume normal operation. If enabled the pump will enter priming mode and then begin interval one (1).

- The XE Series Pump does not require a time clock or relay but either is recommended to assure consistent start/stop times.
- Wire the same as a single speed pump
- Recommended to set for just under 24 hours, for example: off at 7:45 AM and on at 8:00 AM
- Pump will control speeds per its 4/8/12 hour daily schedule

How to: Enable/Disable Priming Mode

When enabled, the XE Series pump has a built in self-priming feature that will cause the pump to operate at 100% for a duration of eight (8) minutes. Priming mode becomes active if either of the following conditions are met:

- Power is first applied to the pump, or
- An interval with a programmed speed follows an interval programmed to STOP, or
- When completing programming or exiting manual override mode

If desired, you may prevent the pump from entering priming mode by disabling this feature.

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Disable Priming Mode



During normal operation, while the LED is solid, press and hold the button for 10 seconds. Hold until the LED flashes rapidly for the 2nd time. Let go of button to disable priming mode.

Enable Priming Mode



*During normal operation, while the LED is solid, press and hold the button for 10 seconds. Hold until the LED flashes rapidly for the 2nd time. Let go of button to enable priming mode.

*When priming mode is enabled after being disabled, the pump will stop briefly then enter priming mode and resume normal operation

How to: Operate Manual Override

During normal operation, the pump speed can be manually overridden for three (3) hours by a quick press and release of the button. There are three (3) speeds available in manual override mode: High Speed (100%), Medium Speed (50%), Low Speed (40%), and STOP (0%).





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Once a speed is selected the pump will remain in manual override mode for three (3) hours then resume normal operation according to the daily schedule. When STOP is selected in manual override mode, the pump will remain stopped until manual override is cancelled, if a manual override speed is selected, or power is removed and then re-applied to the pump. To enter manual override mode follow the steps below:



During normal operation, while the LED is solid, press and release the button one (1) time. Go to Step 2.



The LED will begin slowly flashing one (1) time to indicate pump is in manual override mode. Go to Step 3.

How to: Operate Manual Override (Cont.)



Press and release the button to cycle through the manual override speeds. Choose between High, Med, Low and Stop. Go to step 4.



*The LED will continue to flash slowly during the entire three (3) manual override period, then return to normal operation automatically. To cancel manual override go to step 6.



*Once a speed has been selected the pump will remain in manual override for three (3) hours. Go to Step 5.



To cancel manual override mode, press and hold the button four (4) seconds. LED will flash rapidly and then go solid indicating normal operation has resumed.

*When STOP is selected pump will remain in stopped until manually overridden. See reasons on pg. 17 of this manual.

How to: Replace TriStar XE Shaft Seal



Turn off/unplug all power to the TriStar XE pump. For safety, turn off the power to all other equipment associated with the system.



Pull the power end assembly away from the pump housing. This will provide you with access to the diffuser, impeller, impeller ring, and shaft seal.



Remove the six (6) $\frac{1}{2}$ " bolts from the seal plate. The bolt anchors should stay housed within the pump housing.



Remove the two (2) diffuser screws and pull diffuser off of the seal plate. Slide impeller ring off of impeller. *Remove the 3/16" Allen head impeller screw.

*The impeller screw is reverse thread and must be turned clockwise to be loosened and counter clockwise to be tightened

How to: Replace TriStar XE Shaft Seal (Cont.)



Take off the electrical cover by loosening the two screws on the left side and removing the two screws on the right side. This will provide you access to the motor shaft hold socket.

Step 7



Remove spring seal assembly. Remove four 9/16" motor mount bolts. Slide seal plate off the motor to access ceramic side of the seal.



Slide a 5/16" Allen wrench fully into the shaft hold socket to secure the shaft so it does not spin. Rotate the impeller counter-clockwise to remove.

Step 8



Remove remaining portion of shaft seal from seal plate. Replace with P/N SPX4000SAV. Do not use lubricant or sealant on shaft seal.

How to: Replace TriStar XE Shaft Seal (Cont.)



If replacing the XE power end, it is important to use the correct power end for the pump model. See parts breakdown on pages 38-47.



Reverse steps 1-8 to re-assemble pump. Be sure to configure the wiring properly for input voltage.



How to: Replace MaxFlo XL XE Shaft Seal



Turn off/unplug all power to the MaxFlo XL XE pump. For safety, turn off the power to all other equipment associated with the system.



Pull the power end assembly away from the pump housing. This will provide you with the ability to access the diffuser, the impeller, and the shaft seal.



Remove the four (4) ½" bolts from the seal plate. The bolt anchors should stay housed within the pump housing.



To access the impeller, remove the three (3) diffuser screws and pull diffuser off of the seal plate. There is no impeller screw to remove from the MaxFlo XL XE pump.

How to: Replace MaxFlo XL XE Shaft Seal (Cont.)



Take off the electrical cover by loosening the two screws on the left side and removing the two screws on the right side. This will provide you access to the motor shaft hold socket.

Step 7



Remove spring seal assembly. Remove four 9/16" motor mount bolts. Slide seal plate off the motor to access ceramic side of the seal.



Slide a 5/16" Allen wrench fully into the shaft hold socket to secure the shaft so it does not spin. Rotate the impeller counter-clockwise to remove.

Step 8

Remove remaining portion of shaft seal from seal plate. Replace with P/N SPX2700SAV. Do not use lubricant or sealant on shaft seal.

How to: Replace MaxFlo XL XE Shaft Seal (Cont.)



use the correct power end for the pump model. See parts breakdown on pages 38-47.



Reverse steps 1-8 to re-assemble pump. Be sure to configure the wiring properly for input voltage.



How to: Replace Super Pump XE Shaft Seal



Turn off/unplug all power to the Super Pump XE pump and all other pool equipment.



Remove the four (4) 9/16" bolts from the seal plate.



Pull the power end assembly away from the pump housing. This will provide you with the ability to access the diffuser, the impeller, and the shaft seal.



To access the impeller and shaft seal assembly, pull diffuser off of the seal plate. There is no impeller screw to remove from the Super Pump XE pump.

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How to: Replace Super Pump XE Shaft Seal (Cont.)



Take off the electrical cover by loosening the two screws on the left side and removing the two screws on the right side. This will provide you access to the motor shaft hold socket.

Step 7



Remove spring seal assembly from the impeller. Remove the seal plate from motor mounting plate to access ceramic portion of shaft seal.



Slide a 5/16" Allen wrench fully into the shaft hold socket to secure the shaft so it does not spin. Rotate the impeller counter-clockwise to remove.

Step 8



Remove remaining portion of shaft seal from seal plate. Replace with P/N SPX1600Z2VIT. Do not use lubricant or sealant on shaft seal.

How to: Replace Super Pump XE Shaft Seal (Cont.)



If replacing the XE motor take off the motor mounting plate by removing the four (4) 9/16" bolts that secure it to the motor.



If replacing the XE power end, it is important to use the correct power end for the pump model. See parts breakdown on pages 38-47.



Reverse steps 1-10 to re-assemble pump. Be sure to configure the wiring properly for input voltage.





XE Series Pump Troubleshooting Guide



1: Troubleshooting: System Errors

During normal operation (not programming mode), the XE pump can communicate errors through the LED indicator around the button. Errors are displayed by flashing the LED. The number of flashes will indicate the type of error as shown in the table below.

After troubleshooting the indicated system error, it can be manually reset by pressing and releasing the button once when the error is shown or by cycling power to the pump.



Count number of flashes during normal operation to determine system error.

# Flashes	Error Condition
1	DC voltage out of range
2	Motor current too high
3	IPM temperature too high
4	Pump has stalled
5	Internal motor/drive failure



1A: System Errors: DC Voltage Out of Range 1 Flash



One (1) flash indicates the internal **<u>DC</u>** bus voltage is too high or too low. Press and release button once to reset system error, if the error persists go to step 2.

Step 3



Verify power connections are correct at the breaker, time clock or relay (if used) and motor. Correct wiring if necessary. If correct and error persists go to step 4.



*Verify the voltage jumper is in the correct position for the applied voltage. If it is not correct, move jumper. If the jumper is in the correct position go to step 3.

Step 4



Verify input <u>AC</u> voltage at the motor is within 10% of applied voltage. If not within 10%, have the voltage corrected. If within 10%, replace the pump power end. (pages 38-47)

*Voltage jumper in 230Vac position with 115Vac applied will result in DC Voltage error. Voltage jumper in 115Vac position with 230Vac applied will result in permanent equipment damage

1B: System Errors: Motor Current Too high 2 Flashes



Two (2) flashes indicates the motor current is too high. Press and release button once to reset system error, if the error persists go to step 2.



Remove the impeller and inspect the shaft seal. If shaft seal appears to be rusted or damaged, replace shaft seal. Part numbers can be found on pages 37-46. If issue persists go to step 4.



Check the diffuser and impeller for any evidence of binding issues. Correct any issues found. If no issues are found go to step 3.



Verify input <u>AC</u> voltage at the motor is within 10% of applied voltage. If not within 10%, have the voltage corrected. If within 10%, replace the pump power end. (pages 38-47)

1C: System Errors: IPM Temp Too high 3 Flashes



Three (3) flashes indicate the internal motor components are overheated. Verify nothing obstructs airflow to motor. Go to step 2.



To allow time for components to cool, the error will auto reset after six (6) minutes. If it does not auto reset after six (6) minutes go to step 3.



Press and release button once to reset error. If the error persists, replace the pump power end. (pages 38-47)

1D: System Errors: Pump Has Stalled 4 Flashes



Four (4) flashes indicates motor drive did not start motor. Press and release button once to reset system error, if error persists go to step 2.



Remove the impeller and inspect the shaft seal. If shaft seal appears to be rusted or damaged, replace shaft seal. Part numbers can be found on pages 38-47. If issue persists go to step 4.



Check the diffuser and impeller for any evidence of binding issues. Correct any issues found. If no issues are found go to step 3.



Verify input <u>AC</u> voltage at the motor is within 10% of applied voltage. If not within 10%, have the voltage corrected. If within 10%, replace the pump power end. (pages 38-47)

1E: System Errors: Internal Failure 5 Flashes



Five (5) flashes indicates a problem with the motor/drive. Press and release button once to reset system error, if error persists go to step 2.



*Test voltage to pump. If 230vac verify voltage jumper is in the correct position. Permanent damage can occur if incorrect. Go to step 4.



Verify input <u>AC</u> voltage at motor is within 10% of applied voltage. If not within 10%, correct voltage. If within 10%, go to step 3.



Power end must be replaced. Make certain the voltage jumper is correct prior to applying power to the pump. (pages 38-47)

*Voltage jumper in 230Vac position with 115Vac applied will result in DC Voltage error. Voltage jumper in 115Vac position with 230Vac applied will result in permanent equipment damage

2: Troubleshooting: Motor does not start



Verify input <u>AC</u> voltage at motor is within 10% of applied voltage. If not within 10%, correct voltage. If within 10%, go to step 2.





Check the diffuser and impeller for any evidence of binding issues. Correct any issues found. If no issues are found go to step 4.



*Verify voltage jumper is correct for applied voltage. Check for and correct any issues found. Go to step 3.



If motor still will not start the power end must be replaced. Check **pages 38-47** of this manual for parts list.

*Voltage jumper in 230Vac position with 115Vac applied will result in DC Voltage error. Voltage jumper in 115Vac position with 230Vac applied will result in permanent equipment damage

3: Troubleshooting: Motor Shuts Off, LED is Flashing



Verify input <u>AC</u> voltage at motor is within 10% of applied voltage. If not within 10%, correct voltage. If within 10%, go to step 2.



Turn power off for 30 seconds. If motor still will not start replace the power end. Check pages 37 – 46 of this manual for parts list.

4: Troubleshooting: Motor Hums, Does Not Start



Check the diffuser and impeller for any evidence of binding issues. Correct any issues found. If no issues are found go to step 2.



Turn power off for 30 seconds. If motor still will not start replace the power end. Check pages 38-47 of this manual for parts list.

5: Troubleshooting: Pump Will Not Prime



Check unions to make sure they are properly tightened. Loose unions will cause pump to pull air and not prime. Proceed to step 2.



Clear any debris from basket and fill completely with water. Secure lid to housing and attempt to prime pump. If pump does not prime proceed to step 4.



Make certain pump lid is installed correctly. Check O-ring inside the pump lid for any debris or signs of damage. Proceed to step 3.



Inspect shaft seal for any cracks or signs of wear. Replace with correct shaft seal (pages 38-47) if necessary. After pump is back together repeat step 3 to prime.

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XE Series Pump

Parts Breakdown



Parts Breakdown: TriStar XE





Parts Breakdown: TriStar XE (Cont.)

Ref #	Part #	Description
1	SPX3200UNKIT	Union Connector Kit (2 nuts, connectors, & gaskets)
2	SPX3200A	Pump Strainer Housing, 2"x2 ½" w/ drain plugs
3	SPX3200DLS	Strainer Cover Kit (strainer cover, lock ring, & O-ring)
4	SPX3200M	Strainer Basket
5	SPX3200Z8	Diffuser Screw
6	SPX4000Z1	Diffuser O-ring
7	SPX3200B3	Diffuser
8	SPX3200Z1	Impeller Screw
9	SPX3021R	Impeller Ring
10A	SPX3207C	1.25 THP Impeller w/ Impeller Screw
10B	SPX3210C	1.85 THP Impeller w/ Impeller Screw
10C	SPX3215C	2.25 THP Impeller w/ Impeller Screw
11	SPX3200T	Housing O-ring
12	SPX3200E	Seal plate
13	SPX3200Z211	Housing Insert/Seal Plate Spacer Kit

Parts Breakdown: TriStar XE (Cont.)

Ref #	Part #	Description
14	SPX3200Z3	Housing Bolt
15	SPX3200Z5PAK4	Motor Bolt (package of 4)
16	SPX4000FG	Drain Plug w/ O-ring Kit
17	SPX3200S	Strainer O-ring
18	SPX3200GA	Motor Support
19A	SPX3207X10XEPE	1.25 THP Power End w/ #5-12, #18, #19, #22, & #23
19B	SPX3210X15XEPE	1.85 THP Power End w/ #5-12, #18, #19, #22, & #23
19C	SPX3215X20XEPE	2.25 THP Power End w/ #5-12, #18, #19, #22, & #23
20	SPX3200Z211	Housing Insert/Seal Plate Spacer Kit
21A	SPX3200WF	Optional Riser (aligns w/ Pentair [®] WhisperFlo [®] pump)
21B	SPX3200SR	Optional Riser (aligns w/ Sta-Rite [®] model pumps)
22	SPX3200Q2	Motor Support Adapter
23A	SPX3200SA	Shaft Seal Assembly
23B	SPX4000SAV	Shaft Seal Assembly (Viton)

Parts Breakdown: MaxFlo XL XE



Parts Breakdown: MaxFlo XL XE (Cont.)

Ref #	Part #	Description
1	SPX2700UNKIT	Union Connector Kit (2 nuts, connectors, & gaskets)
2	SPX4000FG	Drain Plug w/ O-ring
3	SPX2300AA	Pump Strainer Housing w/ Drain Plugs
4	SPX2300DLS	Strainer Cover Kit (strainer cover, lock ring, & O-ring)
5	SPX2300Z4	Strainer Cover O-ring
6	SPX2300M	Strainer Basket
7	SX220Z2	Diffuser O-ring
8	SPX2300Z3PAK3	Diffuser Screws (3 pack)
9	SPX2300B	Diffuser
10A	SPX2710CM	1.65 THP Impeller
10B	SPX2715CM	2.25 THP Impeller



Parts Breakdown: MaxFlo XL XE (Cont.)

Ref #	Part #	Description
11	GMX600F	Housing O-ring
12A	SPX2700SA	Shaft Seal Assembly
12B	SPX2700SAV	Shaft Seal Assembly (Viton)
13	SPX2300E	Seal Plate
14A	SPX2310X15XEPE	1.65 THP Power End w/ #7-#15
14B	SPX2315X20XEPE	2.25 THP Power End w/ #7-#15
15	SPX3200Z5PAK4	Motor Bolt (package of 4)
16	SPX2700ZPAK	Hardware Pack (4 housing bolts, seal plate spacers, & Square Nuts
17	SPX1600Z52	Motor Support Base Mount Screws
18	SPX2300G	Motor Support (VSP) w/ Base Mount Screws



Parts Breakdown: Super Pump XE





Parts Breakdown: Super Pump XE (Cont.)

Ref #	Part #	Description
1	SPX1600T	Housing Gasket
2A	SPX1600Z2	Shaft Seal Assembly
2B	SPX1600Z2VIT	Shaft Seal Assembly (Viton)
3	SPX1600Z52	Mounting Foot Screws (Set of 2)
4	SPX3200Z5PAK4	Motor Cap Screws (Set of 4)
5	SPX2600G1	Mounting Foot, VSP (Includes screws)
6	SPX2600E5	Seal Plate
7A	SPX2610X15XEPE	1.65 THP Power End w/ #2, #4, #6-#8, #14, #17, #19
7B	SPX2615X20XEPE	2.25 THP Power End w/ #2, #4, #6-#8, #14, #17, #19
8	SPX1600R	Diffuser Gasket
9	SPX1620AA	Pump Strainer Housing w/ Gasket



Parts Breakdown: Super Pump XE (Cont.)

Ref #	Part #	Description
10	SPX1600M	Basket
11	SPX1600S	Strainer Cover Gasket
12	SPX1600D	Strainer Cover
13	SPX1600PN	Swivel Nut & Hand Knob
14	SPX2600B	Diffuser
15	SPX1700FG	Drain Plug w/ Gasket
17	SPX1600F5	Motor Mounting Plate
18	SPX	Housing Cap Screw
19A	SPX2610C	1.65 THP Impeller
19B	SPX2615C	2.25 THP Impeller

