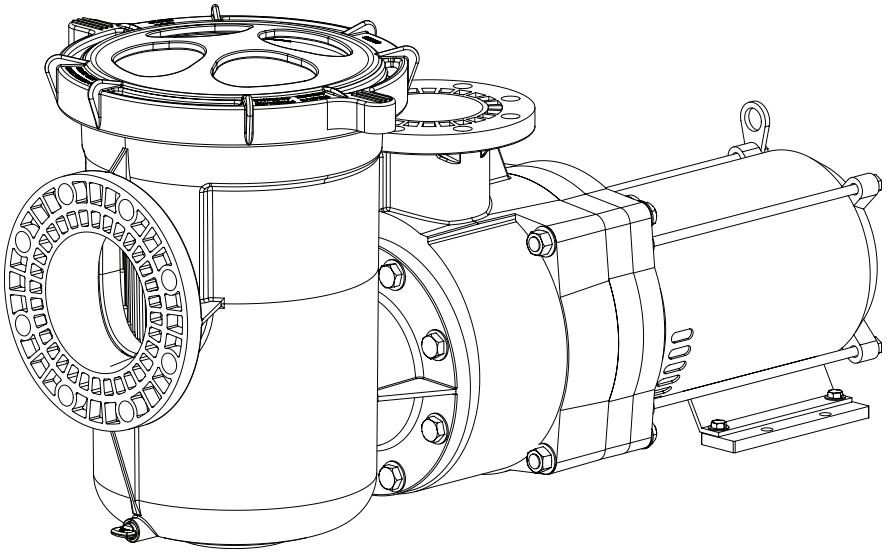
PENTAIR

EQ SERIES®

HIGH PERFORMANCE COMMERCIAL PUMP



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS

SAVE THESE INSTRUCTIONS

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

IMPORTANT NOTICE

This guide provides installation and operation instructions for this pump. Consult Pentair with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the pump.

Attention User: This manual contains important information that will help you in operating and maintaining this product. Please retain it for future reference.

READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

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

⚠ DANGER Warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

⚠ WARNING Warns about hazards that may cause death, serious personal injury, or major property damage if ignored.

⚠ CAUTION Warns about hazards that may or can cause minor personal injury or property damage if ignored.

NOTE Indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.

When installing and using this electrical equipment, basic safety precautions should always be followed, include the following:

⚠ DANGER FAILURE TO FOLLOW ALL INSTRUCTIONS AND WARNINGS CAN RESULT IN SERIOUS BODILY INJURY OR DEATH. **THIS PUMP SHOULD BE INSTALLED AND SERVICED ONLY BY A QUALIFIED POOL SERVICE PROFESSIONAL. INSTALLERS, POOL OPERATORS AND OWNERS MUST READ THESE WARNINGS AND ALL INSTRUCTIONS IN THE OWNER'S MANUAL BEFORE USING THIS PUMP. THESE WARNINGS AND THE OWNER'S MANUAL MUST BE LEFT WITH THE POOL OWNER.**

⚠ WARNING Do not permit children to use this product.

⚠ WARNING **RISK OF ELECTRICAL SHOCK** (For all permanently installed units intended for use on 15 or 20 ampere, 125 through 240 volt, single phase branch circuits). Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.

This unit must be connected only to a supply circuit that is protected by a ground-fault circuit-interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

⚠ CAUTION This pump is for use with permanent swimming pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

General Warnings

- Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a 230 VAC charge even when there is no power to the unit.
- The pump is not submersible.
- The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance potential with old or questionable equipment.
- Code requirements for electrical connection differ from country to country, state to state, as well as local municipalities. Install equipment in accordance with the National Electrical Code and all applicable local codes and ordinances.
- Before servicing the pump; switch OFF power to the pump by disconnecting the main circuit to the pump.
- This appliance is not intended for use by persons (including children) of reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

⚠ DANGER SUCTION ENTRAPMENT HAZARD: STAY OFF THE MAIN DRAIN AND AWAY FROM ALL SUCTION OUTLETS! **THIS PUMP IS NOT EQUIPPED WITH SAFETY VACUUM RELEASE SYSTEM (SVRS) PROTECTION AND DOES NOT PROTECT AGAINST BODY OR LIMB ENTRAPMENTS, DISEMBOWELMENTS (WHEN A PERSON SITS ON A BROKEN OR UNCOVERED POOL DRAIN) OR HAIR ENTANGLEMENTS.**

THIS PUMP PRODUCES HIGH LEVELS OF SUCTION AND CREATES A STRONG VACUUM AT THE MAIN DRAIN AT THE BOTTOM OF THE BODY OF WATER. THIS SUCTION IS SO STRONG THAT IT CAN TRAP ADULTS OR CHILDREN UNDER WATER IF THEY COME IN CLOSE PROXIMITY TO A DRAIN OR A LOOSE OR BROKEN DRAIN COVER OR GRATE.

THE USE OF UNAPPROVED COVERS OR ALLOWING USE OF THE POOL OR SPA WHEN COVERS ARE MISSING, CRACKED OR BROKEN CAN RESULT IN BODY OR LIMB ENTRAPMENT, HAIR ENTANGLEMENT, BODY ENTRAPMENT, EVISCERATION AND/OR DEATH.

The suction at a drain or outlet can cause:

Limb Entrapment: When a limb is sucked or inserted into an opening resulting in a mechanical bind or swelling. This hazard is present when a drain cover is missing, broken, loose, cracked or not properly secured.

Hair Entanglement: When the hair tangles or knots in the drain cover, trapping the swimmer underwater. This hazard is present when the flow rating of the cover is too small for the pump or pumps.

Body Entrapment: When a portion of the body is held against the drain cover trapping the swimmer underwater. This hazard is present when the drain cover is missing, broken or the cover flow rating is not high enough for the pump or pumps.

Evisceration/Disembowelment: When a person sits on an open pool (particularly a child wading pool) or spa outlet and suction is applied directly to the intestines, causing severe intestinal damage. This hazard is present when the drain cover is missing, loose, cracked, or not properly secured.

Mechanical Entrapment: When jewelry, swimsuit, hair decorations, finger, toe or knuckle is caught in an opening of an outlet or drain cover. This hazard is present when the drain cover is missing, broken, loose, cracked, or not properly secured.

NOTE: ALL SUCTION PLUMBING MUST BE INSTALLED IN ACCORDANCE WITH THE LATEST NATIONAL AND LOCAL CODES, STANDARDS AND GUIDELINES.

IMPORTANT PUMP WARNING AND SAFETY INSTRUCTIONS

⚠WARNING **TO MINIMIZE THE RISK OF INJURY DUE TO SUCTION ENTRAPMENT HAZARD:**

- A properly installed and secured ANSI/ASME A112.19.8 approved anti-entrapment suction cover must be used for each drain.
- Each suction cover must be installed at least three (3') feet apart, as measured from the nearest point to nearest point.
- Regularly inspect all covers for cracks, damage and advanced weathering.
- If a cover becomes loose, cracked, damaged, broken or is missing, replace with an appropriate certified cover.
- Replace drain covers as necessary. Drain covers deteriorate over time due to exposure to sunlight and weather.
- Avoid getting hair, limbs or body in close proximity to any suction cover, pool drain or outlet.
- Disable suction outlets or reconfigure into return inlets.

⚠WARNING The pump can produce high levels of suction within the suction side of the plumbing system. These high levels of suction can pose a risk if a person comes within the close proximity of the suction openings. A person can be seriously injured by this high level of vacuum or may become trapped and drown. It is absolutely critical that the suction plumbing be installed in accordance with the latest national and local codes for swimming pools.

⚠WARNING A clearly labeled emergency shut-off switch for the pump must be in an easily accessible, obvious place. Make sure users know where it is and how to use it in case of emergency.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

(A) A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:

(i) A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or

(ii) A properly designed and tested suction-limiting vent system or

(iii) An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

(A) A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or

(B) A properly designed and tested suction-limiting vent system, or

(C) An automatic pump shut-off system, or

(D) Disabled submerged outlets, or

(E) Suction outlets shall be reconfigured into return inlets.

⚠CAUTION **For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers and Automation Load Center)**

Install all electrical controls at equipment pad, such as on/off switches, timers, and control systems, etc. to allow the operation (startup, shut-down, or servicing) of any pump or filter so the user does not place any portion of his/her body over or near the pump strainer lid, filter lid or valve closures. This installation should allow the user enough space to stand clear of the filter and pump during system start-up, shut down or servicing of the system filter.

⚠DANGER **HAZARDOUS PRESSURE: STAND CLEAR OF PUMP AND FILTER DURING START UP.**

Circulation systems operate under high pressure. When any part of the circulating system (i.e. locking ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the pump housing cover, filter lid, and valves to violently separate which can result in severe personal injury or death. Filter tank lid and strainer cover must be properly secured to prevent violent separation. Stand clear of all circulation system equipment when turning on or starting up pump.

Before servicing equipment, make note of the filter pressure. Be sure that all controls are set to ensure the system cannot inadvertently start during service. Turn off all power to the pump. **IMPORTANT: Place filter manual air relief valve in the open position and wait for all pressure in the system to be relieved.**

Before starting the system, fully open the manual air relief valve and place all system valves in the "open" position to allow water to flow freely from the tank and back to the tank. Stand clear of all equipment and start the pump.

IMPORTANT: Do not close filter manual air relief valve until all pressure has been discharged from the valve and a steady stream of water appears. Observe filter pressure gauge and be sure it is not higher than the pre-service condition.

General Installation Information

- All work must be performed by a qualified service professional, and must conform to all national, state, and local codes.
- Install to provide drainage of compartment for electrical components.
- These instructions contain information for a variety of pump models and therefore some instructions may not apply to a specific model. All models are intended for use in swimming pool applications. The pump will function correctly only if it is properly sized to the specific application and properly installed.

⚠WARNING Pumps improperly sized or installed or used in applications other than for which the pump was intended can result in severe personal injury or death. These risks may include but not be limited to electric shock, fire, flooding, suction entrapment or severe injury or property damage caused by a structural failure of the pump or other system component.

Pumps and replacement motors that are single speed and one (1) Total HP or greater cannot be sold, offered for sale, or installed in a residential pool for filtration use in California, Title 20 CCR sections 1601-1609.

CUSTOMER SERVICE / TECHNICAL SUPPORT

If you have questions about ordering Pentair replacement parts, and pool products, please contact:

Customer Service and Technical Support, USA
(8 A.M. to 5 P.M. — Eastern/Pacific Times)
Phone: (800) 831-7133
Fax: (800) 284-4151

Web site
Visit *www.pentair.com* to find more information about Pentair products.*

Sanford, North Carolina (8 A.M. to 5 P.M. ET)
Phone: (919) 566-8000
Fax: (919) 566-8920

Moorpark, California (8 A.M. to 5 P.M. PT)
Phone: (805) 553-5000 (Ext. 5591)
Fax: (805) 553-5515

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** Translated versions of this manual are available online at / La versión en español de este manual del producto, se puede encontrar en línea a :* **www.pentair.com/en-us/products/business-industry/commercial-pool-products/commercial-pool-pumps/-eq-series--commercial-plastic-pump.html**

INTRODUCTION

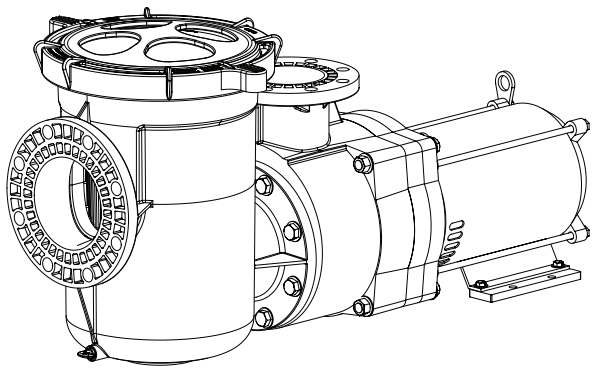
Pump Overview

The EQ Series® High Performance Commercial Pumps deliver extraordinary performance in every key aspect. They're built to last, of course, and are also built to be incredibly efficient, quiet, lightweight and corrosion-resistant. All of this adds up to a pump that is highly cost effective and suited for a wide range of commercial water applications.

At the heart of the EQ Series pump's extraordinary performance is its unique impeller design. It provides two significant benefits. First, it means more efficient performance — the EQ Series pump moves more water more quickly than comparable pumps. And secondly, it means the pump's motor doesn't have to work as hard and, as a result, runs cooler and lasts considerably longer.

The EQ Series pump has been through a rigorous design, development and testing program so you know it's built to handle the toughest commercial applications for years to come.

Available in single and three-phase, 50 and 60 Hz models, the EQ Series pump sets the new standard for performance in pumps. No one else in the industry has made a plastic injection-molded pump with performance like this for pool and water applications.



EQ Series High Performance Commercial Pump

General Features

- EQ Series High Performance Commercial Pump = Energy Efficient and Quiet
- Designed in every detail for maximum efficiency
- The only non-corrosive, all-plastic pump designed exclusively for the commercial pool and water applications market
- The pump impeller features an exclusive design that provides true breakthrough performance
- Lower load due to efficient impeller design means longer motor life
- Cam and Ramp™ lid design with clear lid for added convenience in servicing

Additional Features

- Closed coupled for quiet stable flow operation
- Lightweight
- 6" (15.2 cm) suction and 4" (10.2 cm) discharge with strainer pot
- Closed impeller for longer motor life
- Heat-resistant seal operates at up to 150°F (66°C)
- Bolt-on strainer pot
- Easy one-man installation
- Self-priming pump
- Models available for water feature applications
- NSF Listed
- Some Models are ETL Listed, (see Engineering Specifications table on page 19)
- CE Listed - Conforms with all health, safety and environmental protection standards of the European Union. Applies to 50 Hz models only, (see Engineering Specifications table on page 19).
- Metric flange kit available separately:
  - A-EQ-160: Metric flange kit, suction side EQ Series pump, piping 160 mm
  - A-EQ-125: Metric flange kit, discharge side EQ Series pump, piping 125 mm
  - A-EQ-160B: Metric flange kit, suction side EQ Series pump, piping 160 mm for version without strainer pot

INSTALLATION

The following general information describes how to install the EQ Series® High Performance Commercial Pump.

Note: Before installing this product, read and follow all warning notices and instructions starting on page i-ii.

Installing the Pump

Only a qualified service person should install the EQ Series pump.

Mechanical Installation

1. Carefully remove the pump unit and strainer pot assembly, if included, from its shipping package.
2. The pump will perform best when the suction and return head losses (Total Dynamic Head [TDH]) of the pool system have been carefully determined and the correct pump model selected to fit these requirements. A pump should be selected to operate near the center of its Performance Curve with as high an efficiency as possible. It is also important that the Net Positive Suction Head Available (NPSHA) be greater than the Net Positive Suction Head Required (NPSHR) at the design flow rate.
3. If it is not possible to determine accurate suction and discharge head losses (Total Dynamic Head [TDH]), conservative plumbing practices should be strictly adhered to. This would include installing the pump as close to the pool as possible and at approximately the same level as the pool water level. (See page ii, General Installation Information, regarding when a strainer pot assembly is required.) Use large diameter pipe especially on the suction line to keep flow velocities at or below 6 feet per second (fps), (1.8 meters per second [mps]). Flow velocities in the return plumbing should not exceed 10 fps, (3 mps). Also keep elbows and tees to a minimum. Installations where the pump is going to be installed more that 10 feet, (3 meters), below or 5 feet, (1.5 meters), above the pool water level must be evaluated by an experienced professional to ensure that the pump will function correctly.
4. A solid flat foundation should be provided to support the pump. The area should be well drained so that the pump motor will not be flooded under any circumstances. Ensure that adequate space and lighting around the pump is provided for routine maintenance activities.

   Note: Do not install the pump motor within 5 feet, (1.5 meters), of the inside walls of the pool wall unless the pump bears the UL listing mark. UL listed pumps may be installed within 5 feet, (1.5 meters), of the inside walls of a swimming pool, spa or hot tub only if a solid copper bonding conductor not smaller than No. 8 AWG, (No. 10 SWG), is connected from a bonding lug wire connector on the motor to all metal parts of the swimming pool, spa or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet, (1.5 meters), of the inside walls of the swimming pool, spa or hot tub.
5. The pump suction and discharge pipes will need to be supported mechanically. Support piping within 3 feet (.91 meters) of the suction and discharge to prevent cracking of pump and pipe components. Several items listed below can cause additional stress on the pump and strainer pot if left unsupported.
   - Shutting the pump on and off repeatedly, (Continuous Cycling).
   - Natural vibrations from the water flow in the piping can cause stress on the pump strainer pot and volute.
   - Shutting off the water flow suddenly on a large volume of moving water, (Water Hammer).

   Rigid connections of the pump and piping can cause cracking of the pump and or piping due to the issues above. Flexible pipe joints may also help in reducing the stress on the pump depending on the setup.

   For most installations Pentair recommends installing a valve on both the pump suction and return lines so that the pump can be isolated during routine maintenance. However, we also recommend that a valve, elbow or tee installed in the suction line should be no closer to the front of the pump than five (5) times the suction line diameter. See **Figure 1**.

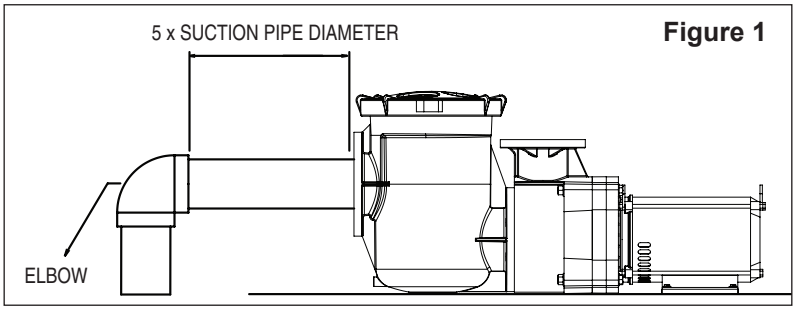


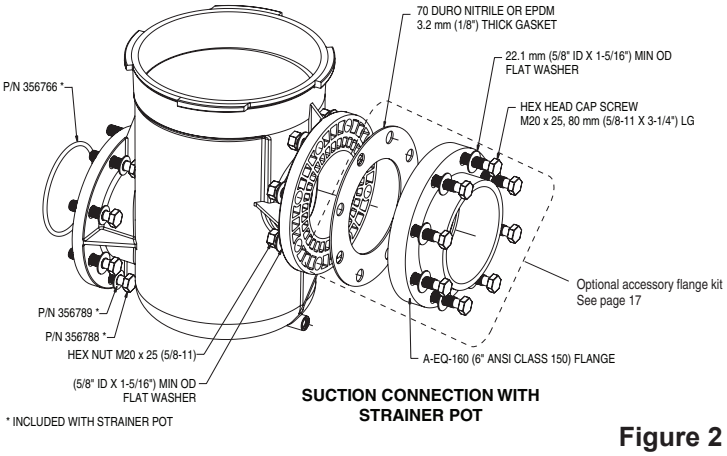
Figure 1

   Example: A 6 inch pipe requires a 30 inch (76.2 cm) straight run in front of the suction inlet of the pump.

   Note: DO NOT install 90° elbows directly into the pump inlet or outlet.

Mechanical Installation (Cont.)

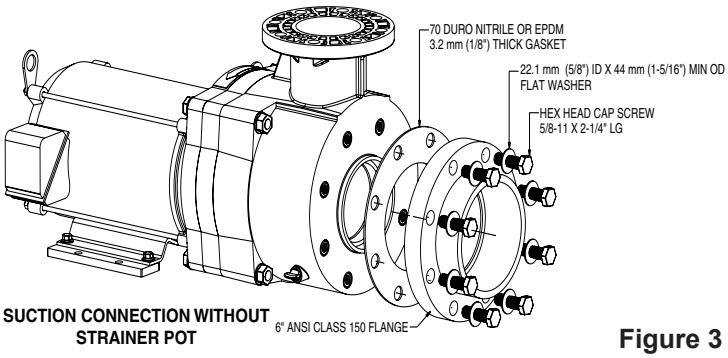
6. Assemble the strainer pot assembly, if included, to the EQ Series® High Performance Commercial Pump. Be sure to install the O-Ring (included with the strainer pot assembly) over the protruding plastic ring on the front of the pump housing before mounting the strainer pot. Properly position the strainer pot to the housing and secure in place using the 8 large flange bolts and washers included with the strainer pot assembly. These bolts should not be over tightened as this could damage the pump. Proper technique is to lightly snug each bolt with a wrench. A squealing sound during tightening of the bolts indicates that the bolts are being excessively tightened.



SUCTION CONNECTION WITH STRAINER POT

Figure 2

7. Place the pump in its final location and ensure that the mating flanges of the suction and discharge piping are in line and parallel to the flanges on the pump. Resolve any problems with misalignment before bolting the flanges to the pump.
8. The pump may be secured to bolts buried in the concrete by using the holes on the outside of the motor supports.



SUCTION CONNECTION WITHOUT STRAINER POT

Figure 3

9. Ensure that the flange gasket is properly positioned between the suction flange of the pump and the flange of the suction piping. Use only high quality rubber, full diameter flange gaskets with holes for the bolts to pass through. It may be necessary to hold the gasket in place with either silicone or two or three drops of a cyanoacrylate (super glue) material. Do not use any other grease or glue as they may contain chemicals that could attack the plastic material. Install the flange bolts hand tight on the suction side of the pump.

⚠CAUTION Some off the shelf, non-Pentair, 6" flange adapters will not work with EQ Series Pump Models without the strainer pot. Note the tabs on the flange on the left, (Figure 4). These tabs will interfere with the strainer pot alignment lip on the housing. This lip is used to locate the strainer pot on models that are so equipped. Please contact Pentair for a replacement flange adapter kit (Pentair P/N 357212).

⚠CAUTION Use large diameter flat washers between the hex nut and the pump flanges to properly distribute the clamping forces on the flange. Tighten the flanges to 20 ft.-lb. (27.1 newton/meters) unless otherwise specified by the flange manufacturer. If it is not possible to use a torque wrench then care should be taken not to over tighten the flange bolts. Failure to follow the above instructions can result in damaging the pump flange.

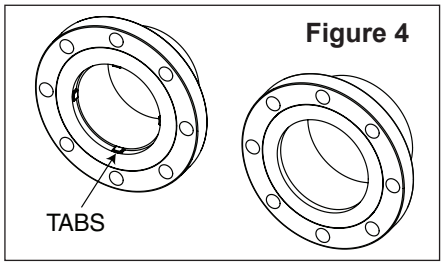


Figure 4

10. Properly insert the flange gasket on the discharge port of the pump. Install the flange bolts hand tight on the discharge flange connection.
11. Inspect both the suction and flange connection to ensure alignment remains acceptable. Take any corrective action before tightening the flange bolts to the required torque.

⚠CAUTION Suction and discharge piping must be supported by an appropriate system of supports or hangers. Inadequately supported pipe can cause excessive loads to be transmitted to the pump resulting in a structural failure of the pump that could result in flooding and property damage.

Pressure Testing

Certain local codes require that the circulation system be pressure tested with a proof pressure before being commissioned into service or before allowing construction to progress to the next stage.

⚠WARNING Improperly pressure testing a circulation system can involve significant risk of property damage or severe personal injury or death. Circulation systems store energy when pressure tested due to the elastic nature of the materials used in construction and due to the compressibility of air that may be contained in the system. The instructions below should be considered a guide only. Each installation should be considered a unique situation that should be carefully investigated for risk.

⚠WARNING Never test this equipment with air pressure even if specified by the local code. Even low levels of air pressure result in tremendous storage of energy that can instantaneously be released if a system failure occurs. This instantaneous release of energy can cause failed components to be accelerated to high velocities and to travel distances of 100 feet (30.48 meters) or more. These components could cause severe personal injury or death if they were to strike a person.

1. Understand the local code. The intent of the code may be to ensure that the piping system with its many bonded joints is leak free. Piping systems typically have a higher pressure capability than the other system components such as the pump or filter. Do not pressure test the EQ Series® High Performance Commercial Pump unless the code specifically requires this.
2. Verify that each component in the system is designed to meet the local code test pressure. Most components should be marked with a maximum operating pressure. If a component is not marked consult the Owner's Instructions that came with the component or consult the manufacturer.
3. Verify that the pressure test will be conducted within the operating temperature listed on the components that make up the circulation system. If no maximum operating temperature is listed then it may be necessary to review the owner's manual or contact the manufacturer for this information. It is common practice for plastic components to be pressure rated at 72° F (22° C). and then derated for temperatures greater than this.
4. Use only a high quality pressure gage that is certified to be accurate for the pressure for which the test is going to be conducted. Do not rely on the pressure gage included with the filtration system as it may not be sufficiently accurate to conduct a pressure test for the system. Please note that the pressure in the system will vary depending on where the pressure is taken due to the weight of the water.
5. Ensure that all air will be evacuated from the system when the water pressure is applied to the system. This will require that all air bleeders on any equipment are open. It also may be necessary to remove some lids or covers on system equipment such as the pump strainer lid to prevent air from being trapped in the system. In addition, there may be other areas of the circulation system where air may be trapped. Do not connect water pressure to the system until you are certain that air will be totally evacuated.
6. Determine the appropriate location in the system to apply the test water pressure. Consider the place in the system that will best ensure that all air will be displaced when water is introduced.

   ⚠WARNING Never exceed the maximum operating pressure or temperature limits of the system components. Pumps installed with the EQ Series Pump Strainer Pot Assembly should not be tested at a pressure that exceeds 20 psi. See the Owner's Manual that accompanies that product for more instructions. Ensure that pressures higher than those required in the pressure test cannot inadvertently be applied to the circulation system. This may require the use of a pressure regulator between the water supply and the circulation system.

   Changes in temperature or barometric pressure can cause the internal test pressure to increase or decrease over time once the system is isolated. If the pump is installed with a strainer pot, a pressure relief device will need to be installed on the strainer pot drain plug to prevent the pressure from exceeding the intended test pressure. Exceeding these limits could result in a component failing under pressure. This instantaneous release of energy can cause failed components to be accelerated to high velocities and to travel distances of 100 feet (30.48 meters) or more. These components could cause severe personal injury or death if they were to strike a person.

7. Slowly apply the water pressure and allow the water to flow out all of the openings intended for air to escape. Close the openings beginning at the lowest level first and progressing to the highest level. Do not close any opening until you are sure that air is completely out of that part of the system.
8. Allow the pressure to slowly build once all of the air openings are closed. Close the valve between the water supply and circulation system to isolate the system from the supply pressure.

Pressure Testing (Cont.)

9. Monitor the system pressure for a few minutes to ensure that it is stabilized.

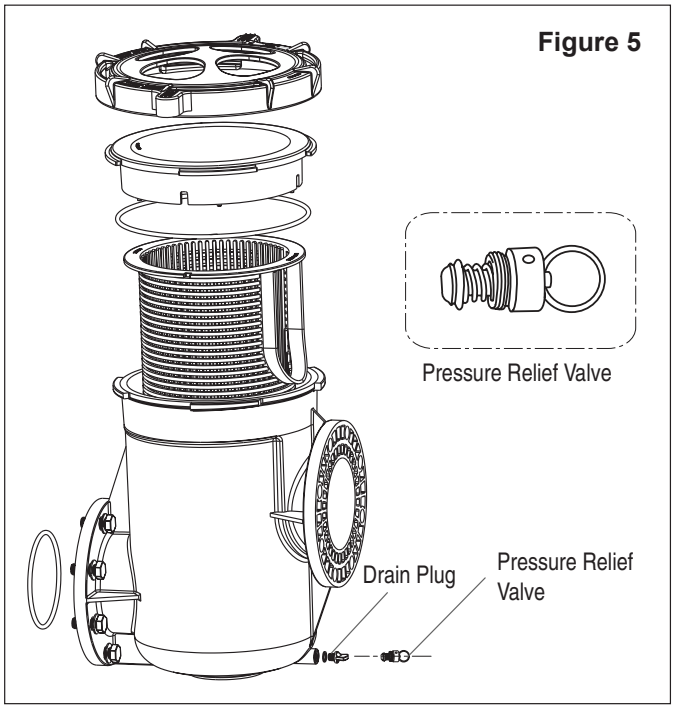
> **⚠WARNING** Due to the potential risk that can be involved it is recommended that the pressure test be kept to the minimum time required by the local code. Do not allow people to work around the system when the circulation system is under pressure test. Post appropriate warning signs and establish a barrier around the pressurized equipment. If the equipment is located in an equipment room, lock the door and post a warning sign.
>
> Never attempt to adjust any closures or lids or attempt to remove or tighten bolts when the system is pressurized. These actions can result in a separation or failure of system components. This instantaneous release of energy can cause components to be accelerated to high velocities and to travel distances of 100 feet (30.48 meters) or more. These components could cause severe personal injury or death if they were to strike a person.

10. It is normal for the test pressure to drift down slightly during the first few minutes as the circulation system expands under pressure.
11. If the system pressure continues to fall, then bleed off the remaining water pressure in the circulation system and inspect the system for leaks. Look for water on the floor and feel around joints for moisture.
12. Ensure the system is not under pressure before attempting any system adjustments or repairs.
13. Repeat the pressurization sequence once the system leaks have been corrected.

Pressure Relief Valve

If a strainer pot is installed, use a pressure relief valve (P/N 350087) in the drain plug of the strainer pot.

Figure 5



ELECTRICAL REQUIREMENTS

This section describes how to secure and wire the EQ Series® High Performance Commercial Pump.

Electrical Requirements

Note: Do not install the pump motor within 5 feet (1.5 meters) of the inside walls of the pool wall unless the pump bears the UL listing mark. UL listed pumps may be installed within 5 feet (1.5 meters) of the inside walls of a swimming pool, spa or hot tub only if a solid copper bonding conductor not smaller than No. 8 AWG (No. 10 SWG) is connected from a bonding lug wire connector on the motor to all metal parts of the swimming pool, spa or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.5 meters) of the inside walls of the swimming pool, spa or hot tub.

⚠CAUTION To prevent possible voltage reduction that cause flicker sensations in lighting equipment, this product should be powered by a dedicated power line. Other equipment connected to the same power line may experience operations problems caused by the inrush current during start-up of this product.

⚠CAUTION This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity.

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.**

This pool pump must be installed by a licensed or certified electrician or a qualified pool installer in accordance with the 2008 National Electrical Code ("NEC") and/or all applicable local codes and ordinances. The specific section of NEC covering your pump may vary depending on your location. Some states, and/or municipalities may not have adopted the 2008 edition of the NEC. In this case your state or local code may only be applicable and/or an earlier edition of the NEC may apply. Please check your local and state codes and regulations before commencing any installation of this pump. Improper installation could create, among other things, an electrical hazard which may result in death or serious injury to pool users, installers, or others due to electrical shock, and/or property damage. Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Failure to do so could result in death or serious injury to pool users, installers or others (due to electrical shock) and/or property damage.

1. Ensure that the electrical service is disconnected, properly tagged and locked out before working on the pump.
2. Carefully review the motor label. Take note of the important nameplate information such as volts, amps, phase, HP and code. Most pump models may be field connected so that they can operate on two different voltage circuits. Use extreme care in reviewing the motor wiring diagrams and always verify the voltage of the electrical supply circuit.
3. Carefully review the electrical supply circuit to ensure that it is adequate to meet the pump requirements identified on the motor nameplate. An electrical code letter is identified on the motor nameplate that identifies the load characteristics of the motor.

   ⚠CAUTION Some single-phase pumps may contain an internal thermal protector designed to temporarily stop the pump if the motor exceeds a preset temperature. The pump will automatically restart when the motor temperature falls to a preset limit. Always disconnect power before working on the pump to eliminate the possibility that the pump could start unexpectedly.

   Three-phase pumps do not contain an internal thermal protector and must be externally protected by an appropriately sized protective device commonly referred to as a starter. Improper sizing of the starter can result in the motor being destroyed or in frequent tripping of the starter.
4. It is important that all portions of the electrical circuit including the conductors that connect the electrical panel to the pump motor are properly sized based on the nameplate information on the pump.
5. Following the National Electrical Code and any local electrical codes connect the grounding conductor and electrical supply conductors to the motor. Ensure that the pump is properly grounded per the above codes utilizing the grounding screw identified in the terminal box of the pump motor.

Electrical Requirements (Cont.)

6. Pumps installed in locations regulated by the International Electrotechnical Commission (IEC) standards shall be supplied by an isolation transformer or supplied through a residual current device (RCD) having a rated residual operating current not to exceed 30 mA.

7. It will be necessary to confirm that the rotation of the motor is in the correct direction on all three-phase pump units and on certain single-phase pump units. Check wiring diagram to determine if motor can be field wired to rotate in both directions. Checking rotation by energizing the pump for one second and then watching the rotation through the back of the motor as it coasts to a stop. Ensure that the rotation matches the direction arrow on the pump. Operating a pump with the incorrect rotation can cause many problems including poor priming, diminished water flow, excessive noise, overloading of the motor and premature failure of the pump.

Field Wiring

Wiring

Note: Due to wide variation in electrical equipment, power equipment, power supply, and installation requirements, **this manual does not make specific recommendations concerning auxiliary equipment or fusing/wiring.**

Wire sizing, wire type, branch circuit fuse protection, motor starter, control equipment, and related items must meet National Electrical Code and local code requirements.

Motors are supplied by several manufacturers and nameplate data (service factor, maximum amperage, etc.) will vary. Consult control manufacturer and motor nameplate on your pump to correctly choose and size motor starter and control equipment for your particular installation. Specific electrical questions or problems should be addressed to the manufacturer of the electrical component in question.

Voltage/Phase

Voltage at single-phase and three-phase ODP motors must be no lower than the minimum motor nameplate rated voltage. If voltage is less than the rated voltage when motor is running at full load, consult power company.

Voltage at three-phase TEFC motors must be no more than 10% above or below motor nameplate rated voltage or motor may overheat, causing overload tripping and reduced component life. If voltage is less than 90% or more than 110% of rated voltage when motor is running at full load, consult power company.

Do not try to connect three-phase motors to single phase power supply or single phase motors to three-phase power supply.

Emergency Shutoff

Install an Emergency Shutoff Switch near pool. Clearly mark this switch and mount it in a location that is accessible to bathers or pool operating personnel (e.g. lifeguards). Make sure that all lifeguards and pool personnel understand the switch's use in case of emergency (entrapment, electrical malfunction, etc.).

⚠CAUTION Always fill the pump with water before energizing the pump motor. Operating the pump without water can damage the pump seal within a few seconds.

INITIAL START-UP

This section describes how to prime the EQ Series® High Performance Commercial Pump.

⚠WARNING Do not operate the pump until you have read and understand clearly all the operating instructions and warning messages for all equipment that is a part of the pool circulating system. The following instructions are intended as a guide for initially operating the pump in a general pool installation, however each installation may have unique conditions where the starting procedure could be different. Failure to follow all operating instructions and warning messages can result in property damage or severe personal injury or death.

1. Relieve any pressure that may be trapped in the circulation system.
2. Open all air relief devices on any equipment in the system.
3. Open the appropriate valves on the suction and discharge plumbing. If the pump is installed below the water level of the pool, water will flow into the pump. If the pump is installed above the water level it will be necessary to fill the strainer pot with water up to the suction pipe connection.

   ⚠WARNING The strainer pot may be at a pressure that is higher or lower than the atmospheric pressure. Always open the drain plug on the strainer pot and allow for the pressure to equalize before removing the locking ring. Attempting to remove the locking ring before the pressure is equalized may result in a rapid exchange of pressure. This instantaneous release of energy can cause components to be accelerated to high velocities and to travel distances of 100 feet (30.5 meters) or more. These components could cause severe personal injury or death if they were to strike a person.

4. Stand clear of all equipment and energize the pump.
5. The pump will experience a temporary unstable condition as water and air flow through the pump. During this unstable condition the pump may be noisy and produce erratic flow. If the pump is below or at water level this temporary unstable condition should last only a few seconds.
6. If the pump is installed above the pool water level then the pump must remove the air from the suction piping. This phase of pump operation is referred to as priming. Pumps that are labeled self-priming have demonstrated in a test laboratory that they can prime when installed 10 feet (3 meters) above the pool water level in a time not exceeding 45 minutes. (***Exception:*** Models EQW300 1PH and EQW300 3PH may require up to 1 hour and 15 minutes to prime to 10 feet (3 meters). Disconnect power to the pump if it does not prime within the time indicated. A pump that will not prime usually indicates a system problem such as an air leak on the suction side of the pump.)

   ⚠WARNING **DO NOT** open the strainer pot if pump fails to prime or if pump has been operating without water in the strainer pot. Pumps operated in these circumstances may experience a build up of vapor pressure and may contain scalding hot water. Opening the pump may cause serious personal injury. In order to avoid personal injury make sure the strainer pot temperature has cooled to room temperature. Carefully remove the drain plug on the strainer pot and allow the pressure to equalize before removing the locking ring.

   Note: It is possible that if the pump fails to prime than the motor will shutdown due to overheating. If this happens, some models will have a red reset button located on the side of the motor on the field wiring box. This button can be very hard to press; use of a flat, blunt tool (nothing sharp) will make resetting the pump much easier, (see **Figure 6**). Be careful when resetting the motor not to puncture the rubber seal around the switch. The button will click into place once completely pressed. If there is no red reset button on the motor, then allow the motor to cool to room temperature before trying to prime again.

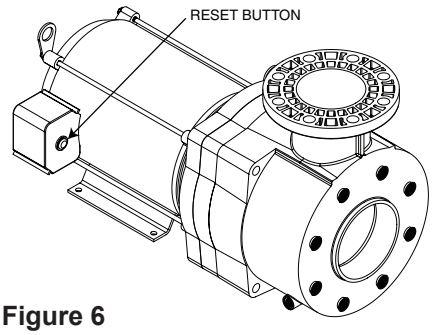


Figure 6

7. It is important that once the pump has primed and is operating in a stable manner that the voltage be measured at the pump when first put into service. If the electrical supply circuit is inadequate a voltage drop may occur when the pump is operating under load. The pump will operate most efficiently when operated at the nameplate voltage.

   Note: Operating single-phase and three-phase ODP pump motors at voltages lower than the minimum voltage listed on the motor nameplate can result in the pump not operating properly.

   Note: Operating three-phase TEFC pump motors at more than 10% above or below the voltage listed on the motor nameplate could result in the pump not operating properly and may damage the pump motor.

Cleaning of the Strainer Basket

1. The EQ Series® High Performance Commercial Pump is designed to be maintenance free with the exception of requiring a periodic cleaning of the strainer basket.
2. A routine inspection should be done by visually looking through strainer lid for debris while the pump is in operation. The strainer basket should be cleaned when approximately 25% blocked. Allowing the strainer basket to become excessively blocked will diminish water flow, reduce pump efficiency, cause cavitation and may damage the basket or other pump components.
3. Disconnect power to the pump before cleaning the basket.
4. Close isolation valves on the suction and discharge lines if necessary to prevent flooding.

> **⚠WARNING** The strainer pot may be at a pressure that is higher or lower than the atmospheric pressure. Always open the drain plug on the strainer pot and allow for the pressure to equalize before removing the locking ring. Attempting to remove the locking ring before the pressure is equalized may result in a rapid exchange of pressure. This instantaneous release of energy can cause components to be accelerated to high velocities and to travel distances of or 100 feet (30.5 meters) or more. These components could cause severe personal injury or death if they were to strike a person.
>
> **⚠WARNING** If the pump has been energized for a period greater than 45 minutes without water flowing through the pump for any reason, the water in the strainer pot may be hot. Attempting to remove the locking ring without removing the drain plug in the pot and allowing the pressure to equalize may result in the hot water rapidly escaping and causing severe personal injury.

5. Open the drain plug in the strainer pot and allow the pressure to completely stabilize.
6. Remove the locking ring and the clear lid from the strainer pot.
7. Remove the basket and dispose of the debris. Use a water hose and soft brush to remove debris blocking the openings in the basket if required.
8. Replace the basket making sure it is properly oriented.
9. Replace the lid, by aligning the four tabs with the tabs on the strainer pot and making sure the O-ring is clean and is properly located in the groove of the lid.

   Note: The lid must be properly aligned before the locking ring will seat completely. Ensure that the notch in the lid is properly aligned with the tab in the strainer pot, (see **Figure 7**). Also ensure that the locking ring is aligned properly before tightening. If the locking ring is misaligned, the handles will interfere with the pump before the locking ring is completely locked, (see **Figure 8** on page 10).
10. Secure the lid in place by tightening the locking ring hand tight only. Do not over tighten the locking ring as that will make removal difficult.

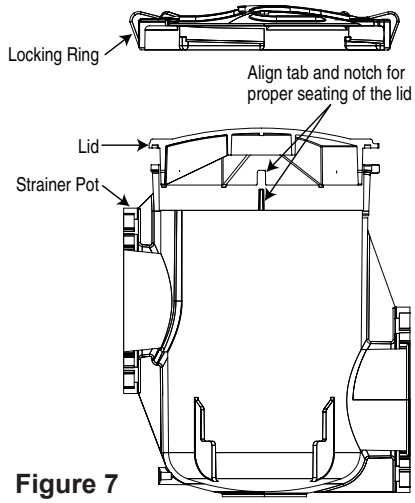


Figure 7

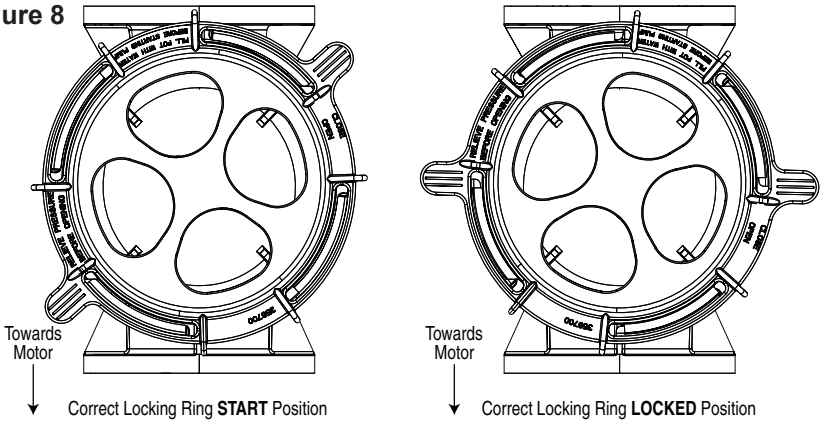
> **⚠WARNING** It is recommended that only water and a soft cloth be used to clean the lid and other pump components. Cleaners may contain chemicals that could damage or weaken pump components causing them to fail and allowing an instantaneous release of energy. This instantaneous release of energy can cause components to be accelerated to high velocities and to travel distances of 100 feet (30.5 meters) or more. These components could cause severe personal injury or death if they were to strike a person.

Preventative Maintenance

It may be possible to extend the life of the EQ Series® High Performance Commercial Pump and to prevent a pump down situation by implementing a preventative maintenance program. This may be done by periodically performing a list of activities and recording certain information to be able to spot potential problems before they become serious. It is recommended that these activities be performed after the filter cleaning procedure so that the information will be taken from the same baseline each time. All or part of the following activities could provide the foundation for a preventative maintenance program.

1. Record the time it takes for the pump to prime and come to a stable operating condition. Increased priming times can indicate a problem. See *Troubleshooting* section, on page 14.
2. Observe the sound coming from the pump housing. A substantial change in sound from inside the pump is a clue that something in the circulation system has changed.
3. Observe the sound coming from the motor. Motor bearings rarely fail without first becoming noisy.

Figure 8



4. Observe the temperature of the motor. The motor is designed to carry the pump load without building up excessive heat. An increase in normal operating temperatures may indicate a potential problem. A thermocouple placed at the motor ventilation discharge opening may be used to monitor motor temperature. It normally takes about 1 hour for the motor temperature to stabilize. See *Troubleshooting* section, on page 14.
5. Record any flow and pressure readings on the circulation system meters and gauges. See *Troubleshooting* section, on page 14.
6. Record supply voltage and amps. Supply voltage can change throughout the day depending on other electrical loads in the area. Changes in supply voltage will affect the amp draw and water output of the pump.
7. Inspect the floor around the pump to ensure there are no indications of leaks. Address leaks immediately. A mechanical seal leak is indicated by water dripping between the motor and the motor adaptor. A mechanical seal leak can result in a failed motor bearing.
8. Inspect the exterior pump components for any sign of a structural failure. Most structural failures will start with a hairline crack that originates from a corner where two different shapes intersect.
9. Verify that the support brackets or hangars for the suction and discharge piping are continuing to fully support the weight of the piping.
10. Motor bearings are a permanently lubricated/sealed type and do NOT need grease or oil applied, (even in the presence of zerk/grease fittings). Applying grease or oil can damage the bearing seal allowing water to enter the bearing causing premature bearing failure.

SERVICING

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.**

This pool pump must be installed by a licensed or certified electrician or a qualified pool serviceman in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

Always disconnect power to the pool pump at the circuit breaker before servicing the pump. Ensure that the disconnected circuit is locked out or properly tagged so that it cannot be switched on while you are working on the pump. Failure to do so could result in death or serious injury to serviceman, pool users or others due to electric shock.

Read all servicing instructions before working on the pump.

The EQ Series® High Performance Commercial Pump is designed to allow for quick servicing of any moving parts without disturbing the plumbing connections. The pump can be serviced with the common tools that are in nearly every service persons toolbox. The following sequential instructions are for a complete disassembly in order to replace a failed motor. The same instructions may be used to perform a partial disassembly to replace any internal component, but following all steps will not be required.

⚠CAUTION It is recommended that you replace the motor with the Pentair replacement motor as identified in the *Replacement Parts* section, on page 15. This motor has been thoroughly tested to ensure that it will function appropriately with the pump under a wide variety of operating conditions. If you choose to use another replacement motor it is important that the frame type, the HP, the service factor, the voltage, the phase and the motor speed match exactly to that listed on the original motor. Slight differences in these parameters can cause the motor to not fit the pump correctly or cause the motor to fail prematurely.

Disassembly - Refer to Replacement Parts Section for Figures

1. Ensure the electric supply circuit is disconnected and is properly tagged and locked out.
2. Disconnect the line supply conductors and the ground conductor from the motor (1) if the motor is being replaced.
3. Close any valves required to prevent flooding when the EQ Series® High Performance Commercial Pump is disassembled.
4. Review the parts breakdown in the *Replacement Parts* section, on page 15, to understand how the pump components are assembled together.
5. Remove the pump housing drain plug (24) and allow the pump to completely drain.
6. Remove the four 5/8 in. hex nuts (23) that secure the motor end assembly to the front housing (22).
7. If the motor support (2) is bolted to a permanent surface it will be necessary to remove the screws (6) that are securing the motor to the motor support (2) to allow for removal of the motor end assembly.
8. Grasp the motor end assembly and pull backwards. It may be necessary to wiggle the motor assembly from side to side to break free the O-Ring seals inside the pump.
9. Pull the motor end assembly free of the housing (22) so that there is adequate access to the internal components. If desired, the supply conductors can be disconnected and the motor end assembly can be taken to a workbench for easier service.
10. Remove the four screws (20) with washers (18) and (19) that secure the diffuser (17) to the seal plate (13).
11. Hold the impeller (15) nose and remove the screw (16) and washers (4) and (5) that secure the impeller (15).
12. The impeller (15) is also secured to the shaft by a parallel key. The impeller (15) can be freed from the shaft and key by grasping the outside of the impeller (15) and pulling the impeller (15) away from the motor (1). It is good practice to inspect the impeller (15) to ensure that the vane passageways are open and that no vanes have been substantially broken or worn.

Disassembly (Cont.)

13. Removing the impeller (15) will expose the two pieces of the mechanical seal (14). It will not be necessary to further disassemble the pump if only a seal replacement is required.
14. The seal plate (13) is attached to the motor adaptor (7) by two dowel pins (26). The seal plate (13) can be freed from these dowel pins (26) by grasping the outside of the seal plate (13) and pulling way from the motor wiggling it from side to side if required.
15. Remove the four screws (10) with washers (8) and (9) that secure the motor adaptor (7) to the motor (1). These components could cause severe personal injury or death if they were to strike a person.

Assembly – Refer to Replacement Parts Section for Figures

1. Ensure that the two 6½ in. long screws (11) with washers (12) are properly inserted into the bottom of the motor adaptor (7) before attaching the motor adaptor (7) to the new motor (1).
2. Properly orient the motor adaptor (7) to the motor (1) and secure in place using the four screws (10) and washers (8) and (9). Pentair recommends the use of the EQ Seal Plate Alignment tool (Pentair P/N 351137S) when mounting the motor adaptor to ensure that the motor adaptor is perfectly aligned to the motor shaft, (see **Figures 9** & **10**).
3. Insert the two dowel pins (26) into the motor adaptor (7).
4. Install the stationary ring of the mechanical seal (14) into the seal plate bore. Ensure that it is fully inserted into the bore with the white surface facing you.

⚠CAUTION The mechanical seal is a highly engineered component that must be carefully handled. The contact faces are manufactured to extremely precise tolerances. These faces must be free of all surface dust and debris. Always wash your hands before handling the mechanical seal. Avoid touching the contact faces except for when pressing the seal ring into the bore. Lubricate the rubber portion with a slight amount of soapy water if required to insert it into the bore. Do not use silicone or other lubricants as this can contaminate the seal face. Rinse the seal face if required after assembly to free it of any dirt or debris.

5. Properly orient the seal plate (13), slip it onto the two dowel pins (26) and secure to the motor adaptor (7) by tapping it toward the motor adaptor (7) until there is no clearance between the two parts.

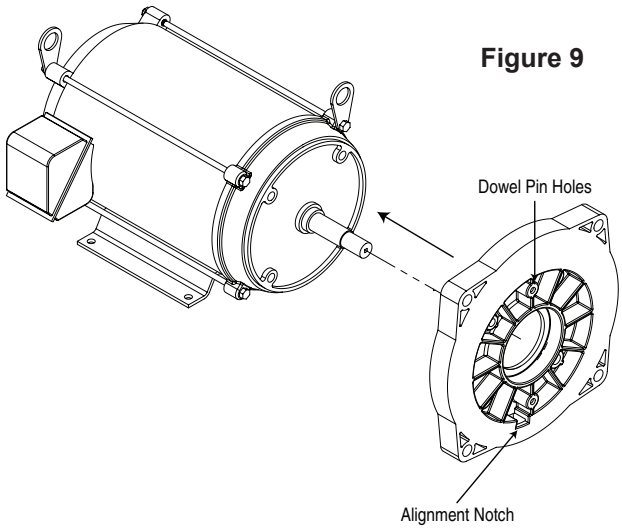


Figure 9

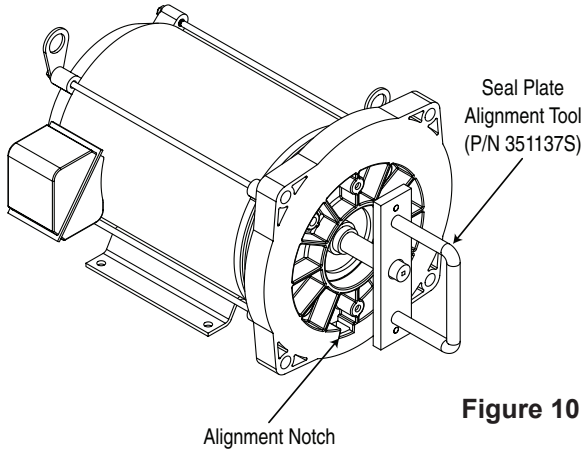


Figure 10

6. Slip the spring portion of the mechanical seal (14) over the motor shaft, being certain that the hard black contact surface is facing the white surface of the stationary seal ring. Use a small amount of soapy water if required to lubricate the rubber of the mechanical seal (14) so that it slips easily over the shaft.
7. Install the shaft key into the shaft of the motor and then install the impeller (15) over the shaft. It will be necessary to align the keyway in the impeller (15) with the key. Push the impeller (15) as far as possible onto the motor shaft (1).
8. Install the socket head screw (16) with washers (4) and (5) to secure the impeller (15). It is important that the screw (16) be tightened securely and that the impeller (15) is fully seated.
9. Apply a light film of silicone grease to the inside diameter of the brass bushing inside the diffuser (17). This film will assist in properly centering the diffuser bushing to the impeller (15) and will reduce the friction should the parts contact during motor start-up. DO NOT USE ANY OTHER TYPES OF LUBRICANTS.

Assembly (Cont.)

10. Install the diffuser (17) over the impeller (15) and secure with the four screws (20), but only hand tight. The diffuser (17) has clearance around the four screws (20) that will allow adjustment of the fit of the diffuser (17) around the impeller (15) nose. Rotate the impeller (15) by hand to ensure that it is free to turn and slowly tighten each of the four screws (20). Verify that the impeller (15) is free to turn once the diffuser screws (20) are fully tightened.
11. Lubricate the diffuser O-Ring (21) and the larger seal plate O-Ring (28) with silicone lubricant. This will allow the O-Rings to slip into place without getting pinched. Ensure that the big seal plate O-Ring (28) is properly seated on the large diameter of the seal plate (13).
12. Carefully slip the motor end assembly into the housing (22) pushing it forward as far as possible until the large seal plate O-Ring (28) comes into contact with the housing (22). Insert the four 6½ in. long screws (11) through the housing (22) and secure the assembly in place using the washers (12) and nuts (23). Gradually tighten each of the four screws a few turns in a crossing pattern to ensure that the motor assembly is properly centered to the housing. Do not over tighten these screws.

⚠CAUTION Failure to follow the above assembly procedures could cause the impeller to bind once the pump is fully assembled. It is possible to remove the strainer basket, reach through the strainer pot and spin the impeller to verify that it will rotate freely. A bound impeller may cause the motor to not start or cause the motor to draw excessive amps.

13. Secure the motor (1) to the motor supports (2).
14. Reconnect the ground and supply conductors.
15. Read and follow the instructions under the Initial Start-up section before putting the pump back into service.

TROUBLESHOOTING

Use the following troubleshooting information to resolve possible problems with your EQ Series® High Performance Commercial Pump.

⚠WARNING **RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.**

Improper installation will create an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and may also cause damage to property.

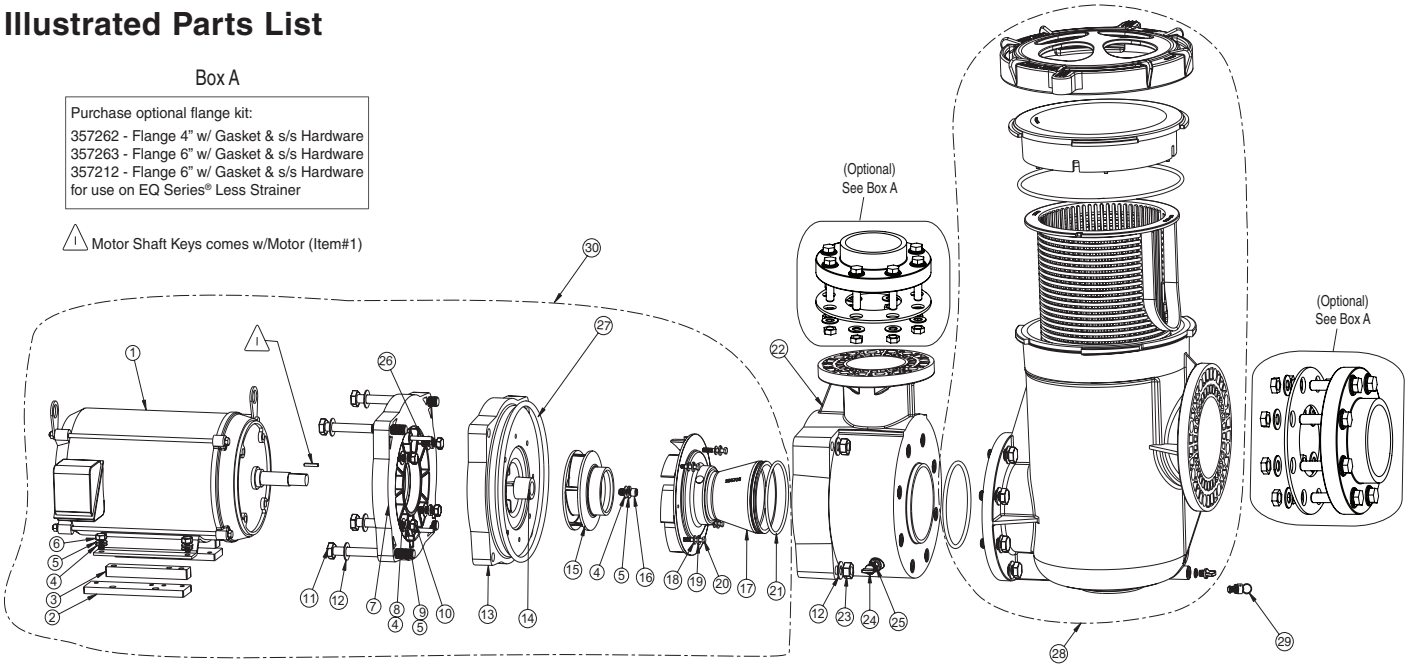
1. If you are not familiar with your pool filtering system and/or heater:
   a. **Do NOT** attempt to adjust or service without consulting your dealer, or a qualified pool technician.
   b. Read the entire Installation & User's Guide before attempting to use, service or adjust the pool filtering system or heater.

Note: Turn off power to unit prior to attempting service or repair.

Problems and Corrective Actions

Problem	Corrective Action
Pump Will Not Prime	No water in Strainer Pot Lid is not tight Damaged lid O-Ring Water level below Skimmer Strainer or Skimmer Basket clogged Closed Valve in Piping System Air leak in Suction Line Pump installed more than 10 ft. (3 m.) above Water Level or otherwise too high for Hydraulic Conditions of Pool Plumbing System Pump Shaft rotating in wrong direction
Low Flow- High Filter Pressure	Filter is dirty Restriction in Filter Line
Low Flow- Low Filter Pressure	Strainer or Skimmer Basket clogged Clogged Impeller Air leak in Suction Line Restriction in Suction Line Cavitation - NPSHA less than NPSHR Pump Shaft rotating in wrong direction
Motor Does Not Turn	Power Switch is off Circuit Breaker has tripped Thermal Protector has tripped Pump is in OFF mode of Timer Motor Shaft is locked by bad Bearing Impeller is jammed
Motor Over Heating	Electrical Supply Connections are incorrect Wiring to Pump is undersized Inadequate Voltage supplied to Site Ventilation is inadequate for Motor Voltage differential between legs of 3 Phase Circuit >5% Pump Shaft rotating in wrong direction
High Pitch OR **Growling Noise Coming from WET END of Pump**	Air Leak in Suction Line Cavitation - NPSHA less than NPSHR A Valve, Elbow or Tee is located too close to the Suction Inlet of the Pump Pump Shaft rotating in wrong direction

Illustrated Parts List



Part No.	Model No.	HP	Phase	Motor No. (Key No. 1)	Additional Motor Support (Key No. 3)	Impeller (Key No. 15)	Diffuser (Key No. 17)
340019, 340030	EQ500	5	1	357065S**	356712	350030	350032
340020, 340031	EQK500	5	3	357068S	356712	350030	350032
340021, 340032	EQ750	7.5	1	357066S	N/A	350029	350033
340022, 340033	EQK750	7.5	3	357069S	356712	350029	350033
340237, 340238	EQ1000	10	1	357063S	N/A	350028	350033
340023, 340034	EQK1000	10	3	357070S	N/A	350028	350033
340024, 340035	EQK1500	15	3	357071S	N/A	350027	356735
340045, 340047	EQK1000 EXPL PF	10	3	350112S	N/A	350027	356735
340046, 340048	EQK750 EXPL PF	7.5	3	350113S	N/A	350028	350033
340049, 340083	EQK1000	10	3	350112S	N/A	350027	356735
340080, 340084	EQK750	7.5	3	350113S	N/A	350028	350033
340081, 340085	EQK500	5	3	350155S	356712	350029	350033
340082, 340086	EQK300	3	3	350156S	356712	350030	350032
340018, 340029	EQK500	5	3	350158S	356712	350070	357273
340017, 340028	EQ500	5	1	350159S**	356712	350070	357273
340148, 340155	EQK500 575V	5	3	355038S	356712	350030	350032
340149, 340156	EQK750 575V	7.5	3	355039S	356712	350029	350033
340150, 340157	EQK1000 575V	10	3	355042S	N/A	350028	350033
340151, 340159	EQK1500 575V	15	3	355044S	N/A	350027	356735
340014, 340026	EQ300	3	1	357064S**	356712	350027	356735
340016, 340027	EQK300	3	3	357067S	356712	350027	356735
340608, 340604	EQKT500	5	3	350731Z	356712	350030	350032
340609, 340605	EQKT750	7.5	3	350732Z	N/A	350029	350033
340610, 340606	EQKT1000	10	3	350733Z	N/A	350028	350033
340611, 340607	EQKT1500	15	3	350734Z	N/A	350027	356735
348086, 348094	EQKT500, EXPORT	5	3	350736S	356712	350030	350032
348087, 348095	EQKT750, EXPORT	7.5	3	350737S	N/A	350029	350033
348088, 348096	EQKT1000, EXPORT	10	3	350738S	N/A	350028	350033
348089, 348097	EQKT1500, EXPORT	15	3	350739S	N/A	350027	356735

NOTE: The "K" in the model number refers to 3 phase. Model numbers without the "K" are 1 phase.
(*)EXPL PF - Explosion proof
(**) - Motor features integral thermal protection

Illustrated Parts List (Cont.)

Item#	P/N	Description
1	–	Motor – See Table on prev. page.
2	356713	Support - Motor - {qty. 2}
3	–	Support Adapter – See Table on prev. page.
4	072184	Washer, Flat 3/8" ID x 7/8" OD .05 Thk 18-8 s/s - {qty. 5 (1) & qty. 9}
5	98220600	Washer Split Lock 3/8" 18-8 s/s- {qty. 5 (1) & qty. 9}
6	A135	Screw 3/8"-16 x ¾" Hx Hd Cap 18-8 s/s (EQ750–1PH, EQ1000, EQ1500) - {qty. 4}
6	350073	Screw 3/8"-16 x 1½" Hx Hd Cap 18-8 s/s (EQ300, EQ500, EQ750–3PH) - {qty. 4}
7	356790	Adapter - Motor - EQ Series
8	075842	Washer, Flat ½" ID x 1¼" OD .125 Thk 300 s/s - {qty. 4}
9	350063	Washer Split Lock 1/2" 18-8 s/s - {qty. 4}
10	U30-74SS	Screw 3/8"-16 x 1" Hx Hd Cap 18-8 s/s (EQ300, EQ500, EQ750–3PH) - {qty. 4}
10	071687	Screw 1/2"-13 x 1¼" Hx Hd Cap 18-8 s/s (EQ750–1PH, EQ1000, EQ1500) - {qty. 4}
11	356710	Screw 5/8"-11 x 6½" Hx Hd Cap 18-8 s/s - {qty. 4}
12	356789	Washer, Flat 11/16" ID x 1-5/16" OD .078 Thk 300 s/s {qty. 8}
13	356795	Seal Plate - EQ Series
14	071725S	Seal Set
15	–	Impeller – See Table on prev. page.
16	071037	Screw 3/8"-16 x 1" Sckt. Hd Cap 18-8 s/s
17	–	Diffuser – See Table on prev. page.
18	51008500	Washer, Flat 1/4" 300 s/s - {qty. 4}
19	072172	Washer Split Lock 1/4" 18-8 s/s - {qty. 4}
20	350035	Screw 1/4"-20 x 1½" Hx Hd Cap 18-8 s/s (EQ500, EQ750, EQ1000) - {qty. 4}
20	356797	Screw 1/4"-20 x 1-¾" Hx Hd Cap 18-8 s/s (EQW300, EQ1500) - {qty. 4}
21	350037	O-ring Diffuser 3/16" x 4-7/8"
22	356755	Housing - EQ Series
23	356776	Nut 5/8"-11 Hx Brass - {qty. 4}
24	357161	Drain Plug
25	192115	O-ring Drain Plug
26	350060	Pin Dowel 5/16" x 1¾" 18-8 s/s - {qty. 2}
27	356780	O-ring Seal Plate 3/8" x 11" dia.
28	340013	Strainer Pot, Complete EQ Series 6" x 6"
29	350087	Pressure Relief Valve
30	355930	Motor Subassembly, 5HP 3PH TEFC
	355931	Motor Subassembly, 7.5HP 3PH TEFC
	355932	Motor Subassembly, 10HP 3PH TEFC
	355933	Motor Subassembly, 15HP 3PH TEFC

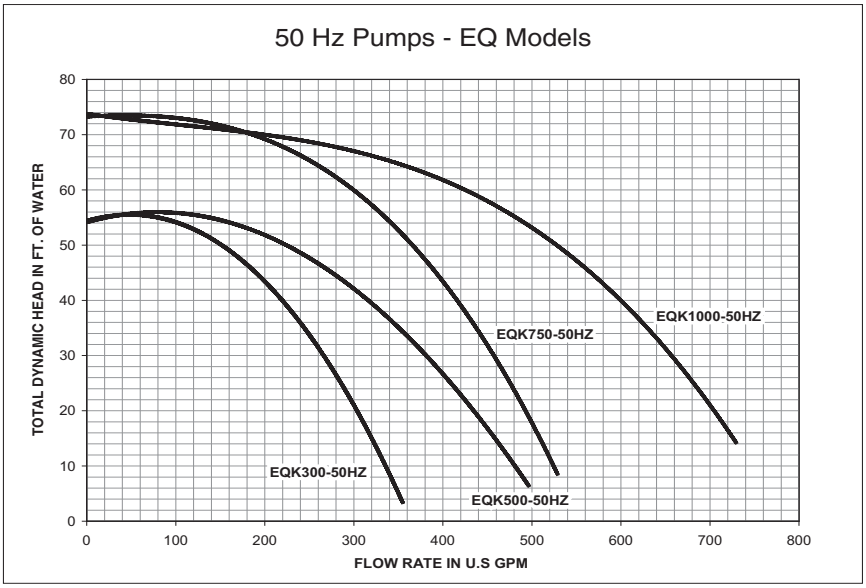
5 Qty. only used on models: EQ750-1PH, EQ1000, EQ1500, EQK750 and EQK1000.

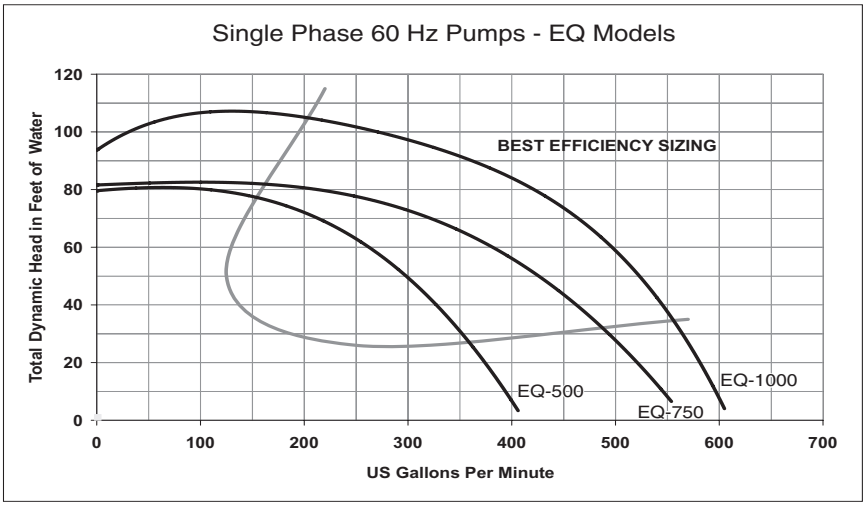
Strainer Pot Parts List

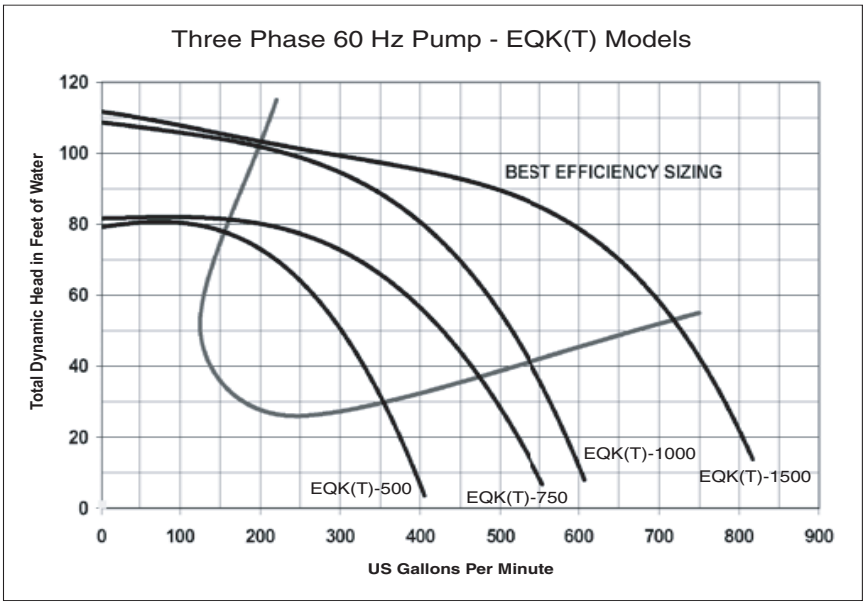
Item #	P/N	Description
EQ Series Hair & Lint Strainer Pot Parts List		
1	356725	Pot EQ Strainer
2	357184	Basket EQ Strainer
3	350166	Gasket, EQ Lid
4	356750	Lid EQ clear
5	350171	Clamp Cam & Ramp™ EQ
6	357161	Drain Plug
7	192115	O-Ring Drain Plug
8	356788	Screw, 5/8" 11 x 1-3/4" Hx Hd Cap 18-8 SS {qty. 8}
9	356789	Washer, Flat 11/16" ID x 1-5/16" OD 0.078 thk 300 SS {qty. 8}
10	350013	O-Ring Pot Flange

TECHNICAL DATA

Performance Curves







Engineering Specifications

	Product No. W/O Pot	Product No. W/Pot	Pump Model	Phase	HP	Voltage	Full Load Amps* (FLA)	SF Amps	Service Factor
	60 Hz Pump Models								
**	**340014**	**340026**	PUMP EQW300 - 1PH 6" x 4"	1	3	208/230	19.5-19.2	21.5	1.15
	340016	**340027**	PUMP EQWK300 - 3PH 6" x 4"	3	3	208-230/460	8.4-7.8/3.9	9.5-8.8/4.4	1.15
**	**340017**	**340028**	PUMP EQW500 - 1PH 6" x 4"	1	5	208/230	23.0-20.9	30.3-26.7	1.25
	340018	**340029**	PUMP EQWK500 - 3PH 6" x 4"	3	5	208-230/460	13.8-13.0/6.5	15.7/7.8	1.0/1.25/1.25
**	**340019**	**340030**	PUMP EQ500 - 1PH 6" x 4"	1	5	230	20.0	23.0	1.15
	340020	**340031**	PUMP EQK500 - 3PH 6" x 4"	3	5	208-230/460	13.5-12.3/6.2	15.7-14.0/7.0	1.15
	340021	**340032**	PUMP EQ750 - 1PH 6" x 4"	1	7.5	230	30.4	35.2	1.15
	340022	**340033**	PUMP EQK750 - 3PH 6" x 4"	3	7.5	208-230/460	20.4-18.2/9.1	24.0-21.0/10.5	1.15
	340237	**340238**	PUMP EQ1000 - 1PH 6" x 4"	1	10	230	40.0	45.0	1.15
	340023	**340034**	PUMP EQK1000 - 3PH 6" x 4"	3	10	208-230/460	27.0-26.2/13.1	31.0-29.4/14.7	1.15
	340024	**340035**	PUMP EQK1500 - 3PH 6" x 4"	3	15	208-230/460	40.0-38.0/18.8	46.0-43.0/21.3	1.15
	340148	**340155**	PUMP EQK500 575V 3PH	3	5	575	5.1	5.9	1.15
	340149	**340156**	PUMP EQK750 575V 3PH	3	7.5	575	7.2	8.3	1.15
	340150	**340157**	PUMP EQK1000 575V 3PH	3	10	575	10.2	11.5	1.15
	340151	**340159**	PUMP EQK1500 575V 3PH	3	15	575	15.0	17.4	1.15
†	**340608**	**340604**	PUMP EQKT500 3PH	3	5	208-230/460	13.4-12.2/6.1	15.1/7.6	1.25
†	**340609**	**340605**	PUMP EQKT750 3PH	3	7.5	208-230/460	19.9-17.8/8.9	22.3/11.2	1.25
†	**340610**	**340606**	PUMP EQKT1000 3PH	3	10	208-230/460	26.4-23.5/11.7	29.7/14.8	1.25
†	**340611**	**340607**	PUMP EQKT1500 3PH	3	15	208-230/460	39.0-36.0/18.0	44.0/22.1	1.25
***	**348086**	**348094**	PUMP EQKT500 3PH, EXPORT	3	5	380-400	7.4-7.2	9.2-8.8	1.25
***	**348087**	**348095**	PUMP EQKT750 3PH, EXPORT	3	7.5	380-400	10.8-10.3	13.6-12.8	1.25
***	**348088**	**348096**	PUMP EQKT1000 3PH, EXPORT	3	10	380-400	14.3-13.7	18.3-17.2	1.25
***	**348089**	**348097**	PUMP EQKT1500 3PH, EXPORT	3	15	380-400	21.2-20.2	27.0-25.3	1.25
	50 Hz Pump Models								
***	**340086**	**340082**	PUMP EQK300 - 50HZ - 3PH 6" x 4"	3	3	230/400	7.9/4.5	9.5/5.5	1.25/1.25
***	**340085**	**340081**	PUMP EQK500 - 50HZ - 3PH 6" x 4"	3	5	230/400	12.3/7.1	15.4/8.8	1.25/1.25
***	**340084**	**340080**	PUMP EQK750 - 50HZ - 3PH 6" x 4"	3	7.5	230/400	18.1/10.4	22.7/13.1	1.25/1.25
***	**340083**	**340049**	PUMP EQK1000 - 50HZ - 3PH 6" x 4"	3	10	230/400	24.0/13.7	30.1/17.3	1.25/1.25
***	**340048**	**340046**	PUMP EQK750 - 50HZ EXPL PF - 3PH 6" x 4"	3	7.5	230/400	18.1/10.4	22.7/13.1	1.25/1.25
***	**340047**	**340045**	PUMP EQK1000 - 50HZ EXPL PF - 3PH 6" x 4"	3	10	230/400	24.0/13.7	30.0/17.3	1.25/1.25

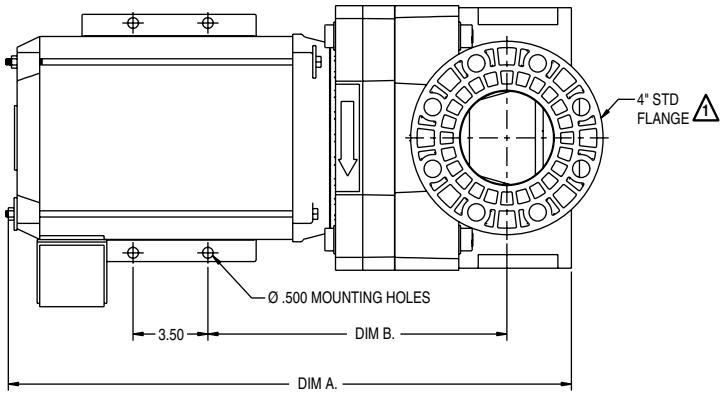
***** This value may vary slightly depending upon motor manufacturer and motor design type.

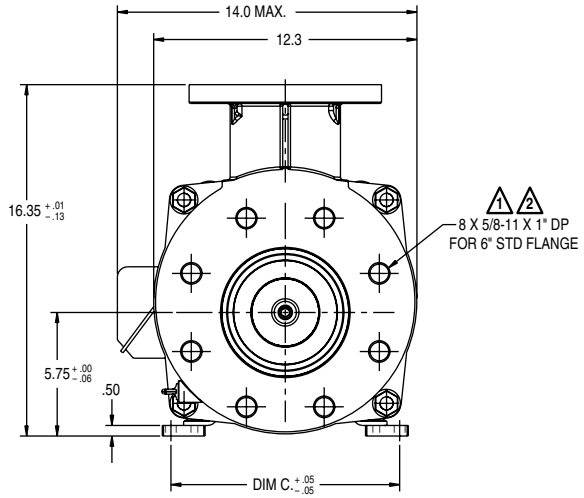
****** ETL Listed ******* CE Listed **†** cUL Listed

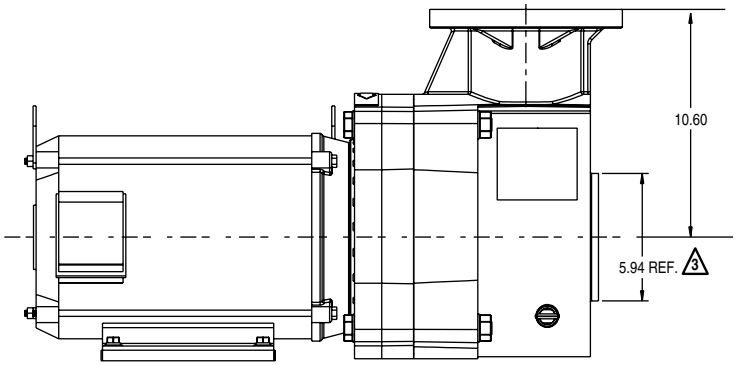
Dimensional Data and Product Weights

Product No. W/O Pot	Product No. W/Pot	Pump Model	Product Weight W/O Strainer (lb.)*	Product Weight With Strainer (lb.)*	Dim A* inches	Dim B inches	Dim C inches	Dim D* inches
60 Hz Pump Models - 1 Phase								
340014	**340026**	PUMP EQW300 - 6" x 4"	97	126	26.62	13.32	9.69	43.59
340017	**340028**	PUMP EQW500 - 6" x 4"	97	126	26.62	14.21	9.69	43.59
340019	**340030**	PUMP EQ500 - 6" x 4"	97	126	26.62	13.32	9.69	43.59
340021	**340032**	PUMP EQ750 - 6" x 4"	132	161	27.53	14.21	10.69	44.59
340237	**340238**	PUMP EQ1000 - 6" x 4"	125	160	26.94	14.03	10.69	43.92
60 Hz Pump Models - 3 Phase								
340016	**340027**	PUMP EQWK300 - 6" x 4"	77	106	23.12	13.32	9.69	40.09
340018	**340029**	PUMP EQWK500 - 6" x 4"	77	106	23.12	13.32	9.69	40.09
340020	**340031**	PUMP EQK500 - 6" x 4"	77	106	23.12	13.32	9.69	40.09
340022	**340033**	PUMP EQK750 - 6" x 4"	87	116	24.50	13.32	9.69	41.56
340023	**340034**	PUMP EQK1000 - 6" x 4"	117	146	26.31	14.38	10.69	43.29
340024	**340035**	PUMP EQK1500 - 6" x 4"	132	161	26.31	14.38	10.69	43.29
340148	**340155**	PUMP EQK500 575V	77	106	24.62	13.32	7.50	41.59
340149	**340156**	PUMP EQK750 575V	87	116	24.62	13.32	7.50	41.59
340150	**340157**	PUMP EQK1000 575V	117	146	26.31	14.07	8.50	43.29
340151	**340159**	PUMP EQK1500 575V	132	161	26.31	14.07	8.50	43.29
340608	**340604**	PUMP EQKT500	97	127	24.52	13.48	9.69	41.5
340609	**340605**	PUMP EQKT750	117	147	26.52	14.19	10.69	43.5
340610	**340606**	PUMP EQKT1000	163	193	28.02	14.19	10.69	45
340611	**340607**	PUMP EQKT1500	177	207	28.02	14.19	10.69	45
348086	**348094**	PUMP EQKT500, EXPORT	97	127	24.52	13.48	9.69	41.5
348087	**348095**	PUMP EQKT750, EXPORT	117	147	26.52	14.19	10.69	43.5
348088	**348096**	PUMP EQKT1000, EXPORT	163	193	28.02	14.19	10.69	45
348089	**348097**	PUMP EQKT1500, EXPORT	177	207	28.02	14.19	10.69	45
50 Hz Pump Models								
340086	**340082**	PUMP EQK300 - 50HZ - 6" x 4"	80	109	24.62	13.48	9.69	41.59
340085	**340081**	PUMP EQK500 - 50HZ - 6" x 4"	80	109	24.62	13.48	9.69	41.59
340084	**340080**	PUMP EQK750 - 50HZ - 6" x 4"	120	150	28.31	14.19	10.69	45.29
340083	**340049**	PUMP EQK1000 - 50HZ - 6" x 4"	132	162	28.31	14.19	10.69	45.29
340048	**340046**	PUMP EQK750 - 50HZ EXPL PF - 6" x 4"	120	150	28.31	14.19	10.69	45.29
340047	**340045**	PUMP EQK1000 - 50HZ EXPL PF - 6" x 4"	132	162	28.31	14.19	10.69	45.29

Dimensional Drawings



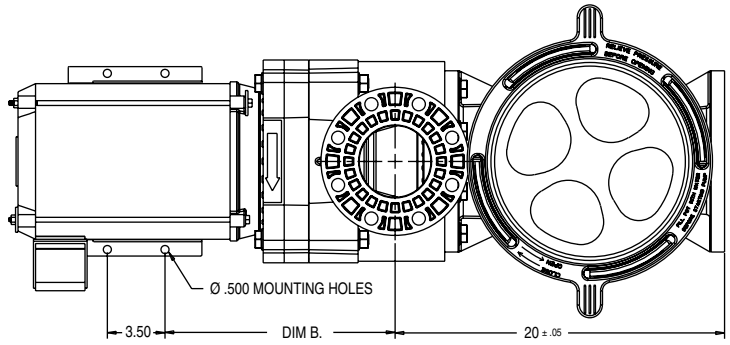




2 FASTENERS AND O-RING ARE INCLUDED WITH EQ SERIES 6 X 6 STRAINER TO CONNECT STRAINER DIRECTLY TO EQ SERIES PUMP. IF PUMP IS TO BE INSTALLED WITHOUT STRAINER, MAKE BOTH CONNECTIONS PER NOTE 1.

1 USE ANSI CLASS 150 PLASTIC FLANGE AND 1/8" THICK CLASS 150 FULL FLANGE GASKET TO MAKE CONNECTION.

3 THIS DIAMETER FITS INSIDE 6" SCH 40 PIPE. DO NOT USE SCH 80 PIPE AS FINAL PIPE SIZE WHEN MAKING THIS FLANGE CONNECTION.



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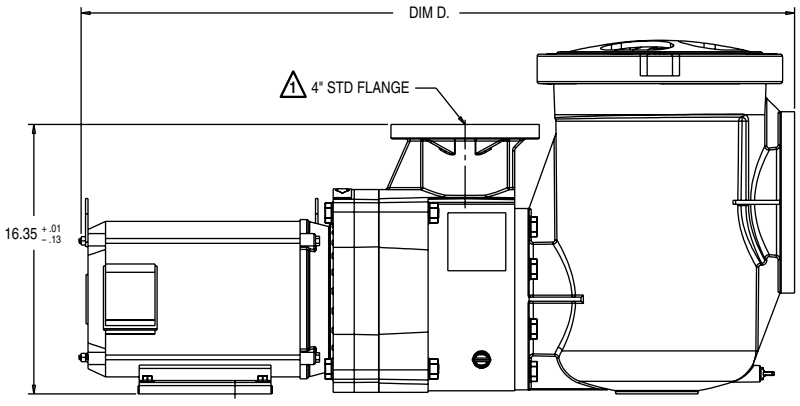

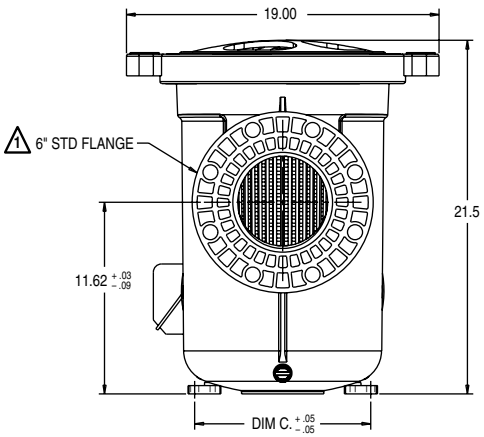

ALL DIMENSIONS ARE IN INCHES.

The following items are for Saudi Arabian export compliance only:

3 Phase, 60Hz, 380-400V Pumps IEC 602335-1 and 602335-2-41
Maximum Water Temperature = 40°C Non-Submersible Pump IP Rating: IP44
Wiring used for connection to pump must have a minimum wiring insulation rating of 90°C.

Motor HP	Maximum Total Head
5	24.39m
7.5	24.70m
10	33.23m
15	34.15m

NOTES

NOTES

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