

# HCP SERIES

## Commercial Self-Priming Pumps

### Manual



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# 1. Description

## 1.1 HCP SERIES SELF-PRIMING CENTRIFUGAL PUMP AND TRAP — LIGHTER WEIGHT, TECHNOLOGICALLY ADVANCED PUMPS FROM 5.5 TO 12.5 HP.

To avoid unneeded service calls, prevent possible injuries, and get the most out of your pump, READ THIS MANUAL CAREFULLY!

The Hayward HCP Series Self-Priming Centrifugal Pump is designed for use with commercial swimming pools or as a centrifugal pump. Is an excellent performer; durable, reliable.

This manual should be furnished to the end user of this pump; its use will reduce service calls and chance of injury and will lengthen pump life.

Technical Support: 1-800-657-2287

Hayward Commercial self-priming pumps provide a technologically advanced alternative to traditional pumps with cast iron housings. They have Thermoplastic, glass-reinforced hydraulic housings, so they're lighter weight for easier one-man installation. Impellers and flanges are made from glass-reinforced Noryl™. HCP pumps are quiet, efficient and designed to recirculate lightly treated water in pools, spas and water features. They won't rust in a chemically corrosive atmosphere. A clear lid allows visual inspection of the strainer basket, to see when it needs cleaning, and opens without tools. Four pumps in the Hayward Commercial Series allow right-sizing for most applications.

## 1.2 TECHNICAL CHARACTERISTICS

### ***Motor:***

Power rating: See nameplate ratings on pump motor

Insulation: Class E

Operation: Continuous

Protection: IP 54

Power: Three-phase (see nameplate ratings)

Consumption: See nameplate ratings

Frequency: See nameplate ratings

R.P.M.: 3,450

Shaft: Stainless steel

### ***Pump:***

Water temperature: Maximum 122°F

Maximum pressure: 40 PSI

Impeller model: Closed

Type of seal: Mechanical retainer

Diffuser: Synthetic Material

Impeller: Synthetic Material

Pump casing: Synthetic Material

Filter cover: Synthetic Material

Basket: Synthetic Material

Suction Port: 4" IPS Union

Discharge Port: 4" IPS Union

## 2. Safety Instructions

This manual contains the necessary instructions for installation, use and maintenance of the HCP Series Self-Priming Pumps. In order to obtain the maximum performance shown by the manufacturer in the Description, it is necessary to fulfill and follow correctly all the recommendations given in this manual.

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

### 2.1 SAFETY SIGNS USED IN THE MANUAL

All instructions referring to possible risks to persons are highlighted by the following symbols:



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.



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



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



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



Other instructions in relation to the functioning of the equipment with which non-compliance could cause physical damages are highlighted with this warning.



indicates special instructions not related to hazards.



DANGER OF ELECTROCUTION

### 2.2 IMPORTANT SAFETY INSTRUCTIONS

Always follow basic safety precautions with this equipment, including the following:



To reduce the risk of injury, allow only trained professionals to install and service this product.



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**

**Hazardous Pressure. Incorrectly installed or tested equipment may fail, causing severe injury or property damage.** Read and follow instructions in owner's manual when installing and operating equipment.

1. Have a trained pool professional perform all pressure tests.
2. Do not connect system to a high pressure or city water system.
3. Use equipment only in a pool or spa installation.
4. Install pump with at least 2 hydraulically balanced main drains equipped with correctly installed, screw-fastened, anti-entrapment certified covers. See pages 14-15.
5. Trapped air in system can cause explosion. BE SURE all air is out of system before operating or testing equipment.

### **Before pressure testing, make the following safety checks:**

- Check all clamps, bolts, lids, and system accessories before testing.
- Release all air in system before testing.
- Hand tighten lid bolts.
- When pressure testing pumps and strainer listed in this manual, water pressure for test must be less than 40 PSI (2.8 bar).
- Water Temperature for test must be less than 100° F (38° C).
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation. Remove trap lid and retighten by hand only.

## **NOTICE**

These parameters apply to Hayward equipment only. For non-Hayward equipment, consult manufacturer.

## **2.3 NAMEPLATE RATINGS**

The information given on the nameplate, or other instructions affixed by the manufacturer to the unit, must be strictly complied with. The content of these plates can be found in this manual under TECHNICAL CHARACTERISTICS, section 1.2; and ELECTRICAL SPECIFICATIONS, section 3.2.

## **2.4 LIABILITY**

Failure to comply with the instructions given by the manufacturer in this manual, in relation to the choice, handling, installation, starting and maintenance of the unit, shall release the manufacturer or distributor from all liability in respect of accidents suffered by persons or damages caused to other installations and, in addition, shall entail forfeit of the warranty.

## **2.5 STANDARDS**

Our HCP Series pumps are manufactured in accordance with the necessary requirements for safety and health.

## 2.6 GENERAL INSTRUCTIONS IN RELATION TO USER SAFETY



Safety during operation of the machinery supplied can only be guaranteed if it is used in accordance with the diagrams shown on page 11. It must never exceed the working conditions and limits given in this manual under Technical Characteristics. Compliance with U.S. safety standards is mandatory.



Please ensure that the equipment selected is adequate for the use for which it is intended and that its condition, installation, initial and subsequent use are correct. See section on Technical Characteristics.



Installation, repair and maintenance operations will be carried out in all cases with the equipment disconnected from the main power supply.



While the equipment is functioning, it cannot be moved or repositioned. These operations will be carried out at all times with the machine disconnected.



Pressing of the electrical on/off or safety elements will not be performed where it is damp, and special care must be taken for user's hands to be dry, and also with footwear and surfaces with which the user is in contact.



Those elements of the equipment which, when functioning, are in movement or which could reach dangerous temperatures will be protected with cages or casing which will prevent accidental contact with the same.



Electricity conductors, or parts which could carry current, will be suitably insulated. Other metal parts of the equipment will be correctly grounded.



Spare parts that may be necessary will be originals from the manufacturer or those recommended by the manufacturer. The use of others, or originals rectified by others, is not permitted and releases the manufacturer or distributor from all liability.



Risk of electrical shock, see section 6.

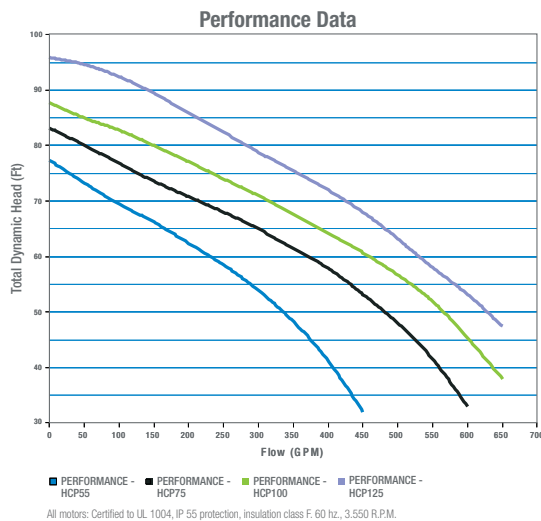
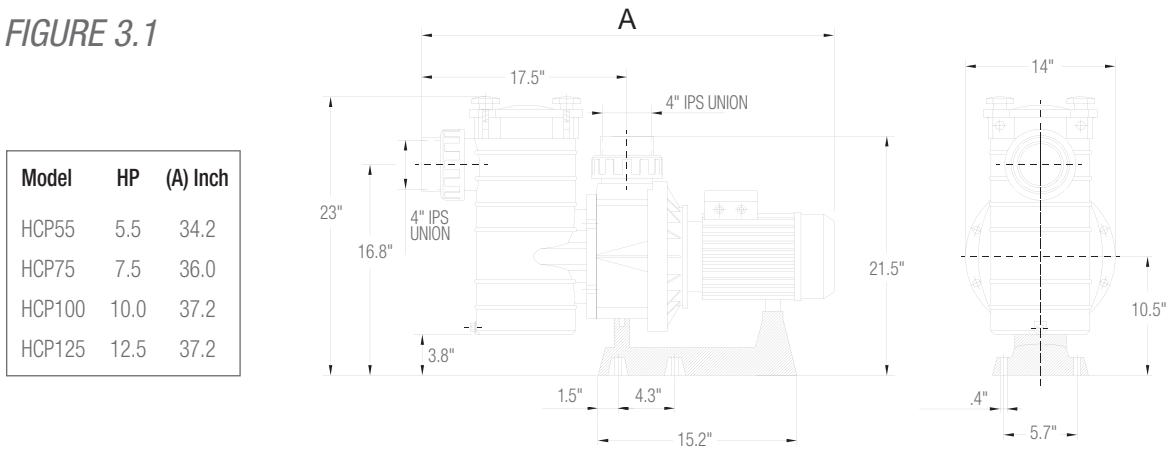


Suction entrapment hazard, see section 7.6.



### 3. Dimensions

FIGURE 3.1



Head Loss in Ft – HCP Single Speed Pumps

GPM	PERFORMANCE - HCP55	PERFORMANCE - HCP75	PERFORMANCE - HCP100	PERFORMANCE - HCP125
0	77.4	83.2	87.78	95.9
50	73.3	80.1	85	94.64
100	69.5	76.8	82.8	92.44
150	66.2	73.6	80	89.42
200	62.4	70.8	77.1	85.9
250	58.5	68	74	82.43
300	53.9	65	71	78.8
350	48.3	61.4	67.7	75.5
400	41.2	57.9	64.2	72
450	32	53.2	60.7	68
500		48	56.7	63.2
550		41.5	51.9	58
600		33	45.33	53.2
650			38	47.4
700				

FIGURE 3.2 - ELECTRICAL SPECIFICATIONS:

Commercial Pump Ordering Information

Model No.	Horse-power	Voltage	Phase	Amps	Dimensions	Shipping Weight (lbs)
HCP55	5.5 hp	230/460	3	14.6/7.3	35.00"	101
HCP75	7.5 hp	230/460	3	21/10.5	35.98"	132
HCP100	10.0 hp	230/460	3	26.1/13	37.16"	154
HCP125	12.5 hp	230/460	3	31.6/15.8	38.74"	165



## 4. Packing, Transport and Storage

### 4.1 HANDLE WITH CARE

Pump and strainer are heavy. Remove outer carton before trying to move. Check items received against packing list to be sure that all equipment has been received. Inspect for shipping damage. If found, file claim with carrier immediately.

**ATTENTION** The manufacturer supplies the equipment protected in suitable packaging, so that it is not damaged during transport or storage thus preventing its correct installation and/or function.

**ATTENTION** The user, upon receipt of the equipment, will immediately check the following points:

- Condition of the outside packaging; if this shows signs of serious deterioration, he shall formally advise the person delivering the equipment.
- He shall also check the condition of the contents; should this show defects which would presumably prevent correct functioning, he shall also formally notify the supplier within a period not exceeding 8 days from the date of delivery.

**ATTENTION** Storage conditions must ensure the optimum preservation of the equipment. Due to its particular relevance, we must stress that very damp atmospheres, or others where there are brusque changes in temperature (which cause condensation), must be avoided.

### 4.2 CLEAN-UP

Clean up all trash and other materials which will interfere with installation from foundation and surrounding area. For easy assembly, make sure all threaded joints and mating surfaces are clean. If necessary, clean with wire brush and solvent.

**▲ WARNING** Fire and explosion hazard. To reduce danger of explosion and fire, do not use gasoline as a cleaning solvent.

Remove all foreign material (packing, etc.) from pump and strainer.

**▲ WARNING** Fire and burn hazard. Modern motors run at high temperatures. To reduce the risk of fire, do not allow leaves, debris, or foreign matter to collect around the pump motor. To avoid burns when handling the motor, let it cool before trying to work on it.

## 5. Installation

### 5.1 LOCATION

**ATTENTION** Only qualified, licensed personnel should install pump and wiring.

The place where the pump motor is to be located must be dry. In all events, there must be a drain in the floor as a prevention against flooding. If the pump is to be located in a damp place, a ventilation system must be provided in order to prevent the formation of condensation. In the case of very confined areas, cold air can reach a low temperature which requires a ventilation system whereby the atmospheric temperature does not exceed 104°F. Store pool chemicals away from pump. It is important for there to be sufficient space to permit the motor block to be dismounted horizontally and the air filter vertically (see minimum space diagram in fig. 1, page 22).

### 5.2 FOUNDATION **ATTENTION**

The foundation must be located away from corrosive or flammable liquids. Have enough ventilation to maintain air temperature at less than the maximum ambient temperature rating (Max. Amb.) listed on the motor model plate. If this pump is installed in an enclosure/pump house, the enclosure must have adequate ventilation and air circulation to keep the temperature in the enclosure at or below the motor's rated ambient temperature whenever the pump is running.

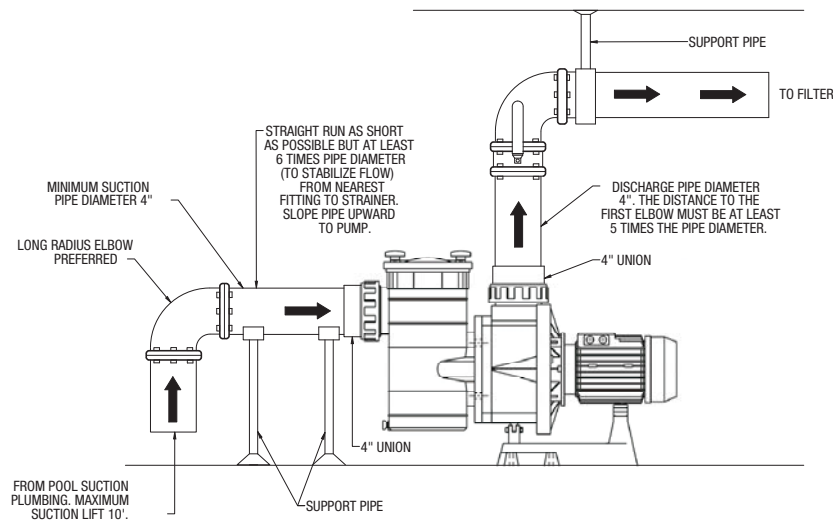
- Be Solid - Level - Rigid - Vibration free.
- Be provided with necessary hold-down bolts, washers, and shims.
- Allow pump inlet to be as close to water level as possible.
- Use short, direct suction pipe (to reduce friction losses).
- Maximum suction lift is 10' (3 m).
- Allow for gate valves in suction and discharge piping.
- If vertical suction lift is higher than 5 feet, installation of a foot valve at lowest portion of the vertical suction pipe may be needed.
- Have adequate floor drainage to prevent flooding.
- Be protected from excess moisture.
- Allow adequate access for servicing pump and piping.

Choose a solid, flat surface for mounting the pump. It's important to choose an area that has a drain, so that the pump motor will not be in danger of going underwater. Be sure there is enough space and light around the pump for routine maintenance.

In permanent installations, with the pump positioned at a higher level than that of the water, the suction pipe must be connected to a foot valve, and it is advisable for its longest stretch to be below the suction center line of the pump until it reaches the vertical pipe which coincides with it. In fixed installations, with the pump below the water level, a shut-off valve will be placed on the suction pipe and another on the discharge pipe.

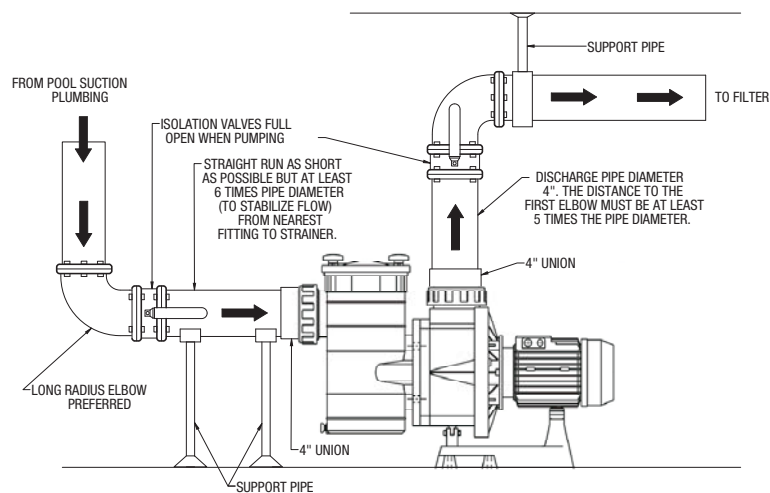
### 5.3 HCP PUMP PIPING - SUCTION LIFT INSTALLATION

Figure 5.3 Installation Diagram. NOT TO SCALE.



### 5.4 HCP PUMP PIPING - FLOODED INSTALLATION

Figure 5.4 Installation Diagram. NOT TO SCALE.



## 6. CONNECTION TO THE MAIN POWER SUPPLY

### 6.1 ELECTRICAL

#### **⚠ WARNING**



Hazardous voltage. Can shock, burn, or cause death. Ground pump before connecting to power supply.

#### **⚠ WARNING**

Disconnect power at service panel before connecting motor.



Ground motor before connecting to electrical power supply.



Failure to ground motor can cause severe or fatal electrical shock hazard.



Do not ground to a gas supply line.



To avoid dangerous or fatal electrical shock, turn OFF power to motor before working on electrical connections.



Match supply voltage to nameplate voltage. Incorrect voltage and/or wiring can cause fire or seriously damage motor and voids warranty.



All electrical wiring, grounding, and bonding must be done by a licensed electrical contractor who is familiar with commercial swimming pool installations and electrical codes and requirements.

HCP Series pumps must be installed by a licensed or certified electrician, or a qualified pool service person, in accordance with the National Electrical Code, as well as all applicable local codes and ordinances. Improper installation could create an electrical hazard, which could result in death or serious injury to pool users, installers or others due to electrical shock. Improper installation may also damage property. Before servicing the pump, disconnect power at the circuit breaker. Failure to disconnect power at the circuit breaker could result in death or serious injury.

#### **NOTICE**

Due to wide variation in electrical 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.

### 6.2 VOLTAGE

Voltage at motor must be not 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 3-phase motors to single phase power supply or single phase motors to 3-phase power supply.

### 6.3 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).

### 6.4 GROUNDING/BONDING

Install, ground, bond and wire motor according to local and National Electrical Code requirements.

Permanently ground motor. Use green grounding terminal provided under motor canopy or access plate; use size and type wire required by code. Connect motor ground terminal to electrical service ground.

Bond motor to pool structure according to local or National Electrical Code. Use a solid copper conductor, size No. 8 (6.0 mm<sup>2</sup>) AWG or larger.

### 6.5 WIRING

Pump must be permanently connected to circuit; be sure no other appliances are on the same circuit.

Make sure that motor nameplate connection diagram includes connection diagram for available voltage. If not, consult power company or a licensed electrician.

Check rotation before attaching strainer and before making final connection to power supply. Pump should rotate counterclockwise when viewed through pump suction port.

**To change rotation:** Three phase motors: Reverse any two leads to motor.

Single phase motors: Follow motor manufacturer's instructions to reverse.

#### **ATTENTION**

Ensure that the motor shaft turns freely; do not start the pump if it is blocked. For this purpose, HCP Series pumps have a groove at the end of the shaft, on the motor end, which permits it to be turned manually using a screwdriver (fig. 1, page 22). In tri-phase motors, the impeller (13) can be unscrewed if the motor starts in the opposite direction. Counter-rotation can even damage the mechanical seal. Start the motor for a few seconds and check that the direction of rotation coincides with that indicated by the arrow on the motor cover. Should this not be the case, it is absolutely necessary to advise the authorised installer (invert the phase connection).

#### **ATTENTION**

Check that the motor does not exceed the amperage indicated on the nameplate rating (80) (fig. 4, page 23); otherwise, regulate using the discharge valve. We will avoid the prolonged operation of the pump: unprimed, with the closed valve or by lack of water in suction piping.

### 6.6 ENGINEERING SPECS

**See pg. 8**

## 7. Pump Suction Requirements

### **▲ WARNING**

Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or allow anyone else to use a pool, spa, or hot tub unless it has at least two suction outlets to each pump suction line (see “Outlets Per Pump,” section 7.3). Do not use or operate swimming pools, spas, or hot tubs if a suction outlet cover is missing, broken, or loose. Follow the guidelines below for a pump installation which minimizes risk to users of pools, spas, and hot tubs.

### 7.1 ENTRAPMENT PROTECTION

The pump suction system must provide protection against the hazard of suction entrapment or hair entrapment/entanglement.

### 7.2 SUCTION OUTLET COVERS

All suction outlet covers must be maintained. They must be replaced if cracked, broken, or missing. See page 15 for outlet cover certification requirements. All suction outlets must have correctly installed, screw-fastened covers in place.

### 7.3 OUTLETS PER PUMP

Provide at least two hydraulically balanced main drains, with covers (see fig. 7.6 & 7.7, page 15), for each swimming pool pump suction line. The centers of the main drains (suction fittings) must be at least three feet apart.

The system must be built so that it cannot operate with the pump drawing water from only one main drain (that is, there must be at least two main drains connected to the pump whenever it is running, see fig. 7.6 & 7.7). However, if two main drains run into a single suction line, the single suction line may be equipped with a valve which will shutoff both main drains from the pump.

More than one pump can be connected to a single suction line as long as the requirements above are met.

### 7.4 WATER VELOCITY AND FLOW RATES

The maximum water velocity must be six feet per second or less unless the outlet complies with the latest ASME/ANSI Specification for Suction Fittings For Use in Swimming Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.

If 100% of the pump's flow comes from the main drain system, the maximum water velocity in the pump suction hydraulic system must be six feet per second or less even if one main drain (suction fitting) is completely blocked. The flow through the remaining main drain(s) must comply with the latest ASME/ANSI Specification for Suction Fittings For Use in Swimming Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.



## 7.5 PIPING – GENERAL

System piping must be at least equal to size of pump connections.

To prevent strain on the pump casing and foundation, pipe and fittings must be aligned to pump without forcing.

To avoid strains on the pump, support both suction and discharge pipes independently. See section 5.3.

Place these supports near the pump.

To avoid a strain left by a gap at the last connection, start all piping at the pump and run pipe *away* from the pump.

## 7.6 PIPING – SUCTION

### **⚠ WARNING**



Hazardous suction. Can trap hair or body parts, causing severe injury or death. Do not block suction. Risk of severe injury or drowning from hair or body entrapment. To reduce risk of entrapment against pump suction opening, connect pump to multiple drains and skimmers of non-entrapment design.

### **NOTICE**

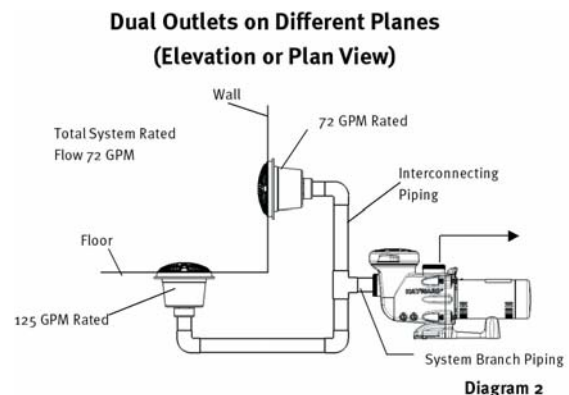
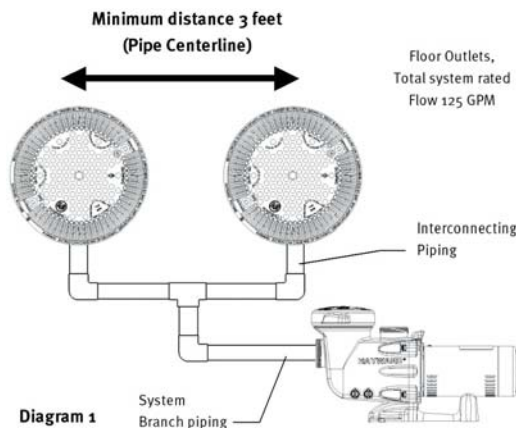
If pump suction becomes clogged, pump will cavitate, damaging pump internal parts. Keep suction pipe clear of debris, dirt, etc.

### **NOTICE**

To prevent flooding when removing pump for service, all flooded suction systems must have valves in suction and discharge pipes.

Use at least 4" (101 mm) pipe. Never use a suction pipe smaller than the pump suction connection. Use larger pipe as required to keep water velocity below six feet per second in suction lines and ten feet per second in discharge lines. If code requires a lower water velocity, comply with the code. Suction pipe must rise continuously from source to pump. To avoid air locking, do not allow high spots in pipe. When using reducer to connect to pump flange, use an eccentric reducer with the straight side on top.

*Figure 7.6 & 7.7 - Recommended Pump Section Layout.*





## 7.7 PIPING – DISCHARGE

To minimize friction losses, make piping one size larger than pump openings.

Fittings restrict flow; for best performance use fewest possible fittings.

Avoid fittings which could cause an air trap.

Pool fittings must conform to International Association of Plumbing and Mechanical Officials (IAPMO) standards.

## 7.8 PIPING - STRAINER

### **WARNING**

Hazardous pressure. Maximum hydrostatic test pressure is 40 PSI (2.8 bar) water pressure. To avoid explosion hazard, DO NOT test strainer with air pressure. Air pressure in strainer can blow cover off of strainer body, which can cause severe or fatal injury.

To avoid breaking pump or putting unnecessary strains on pump or strainer body, support pipe independently of pump/strainer. See section 5.3.

Center the strainer cover when installing it (especially when pressure testing).

When installing cover, clean O-Ring surface in strainer body and lid surface in contact with O-Ring.

# 8. Start-Up and Operation

## 8.1 Prior to Start-Up

NOTE - If it is necessary to perform a pressure test, prior to initial use, to ensure pump is functioning properly, then the following criteria should be maintained for this test:



1. Have a professional perform this test.
2. Ensure all pump and system components are sealed properly to prevent leaks.
3. Remove any trapped air in the system by fully opening filter manual air relief valve until a steady stream of water (not air or air and water mix) is discharged from the valve.
4. Allow no more than 40 psi (275 kPa) at a water temperature no higher than 100° F (38° C).
5. Run pressure test for no longer than 24 hours. Immediately inspect all parts to verify they are intact and functioning properly.

### **WARNING**



If pump is being pressure tested (40 PSI MAXIMUM), be sure pressure has been relieved prior to removing cover.

### **WARNING**



All suction and discharge valves MUST be OPEN, as well as filter air relief valve (if available) on filter, prior to starting the circulating pump system. Failure to do so could result in severe personal injury.

## 8.2 Starting/Priming the Pump

- Release all pressure from filter, pump, and piping system. See filter owner's manual.

### **▲ WARNING**

Return to filter to close the manual air relief valve when a steady stream of water (not air or air and water) is discharged from the valve. Failure to do so could result in personal injury or death.

- If water source is higher than the pump, pump will prime itself when suction and outlet valves are opened. If water source is lower than the pump, unscrew and remove strainer cover; fill strainer housing with water.

### **ATTENTION**

NEVER OPERATE THE PUMP WITHOUT WATER. Water acts as a coolant and lubricant for the mechanical shaft seal. NEVER run the pump dry. Running the pump dry may damage seals, causing leakage, flooding and voids the warranty. Strainer housing must be filled prior to starting.

- Clean and lubricate strainer cover O-ring with petroleum jelly, each time it is removed. Inspect O-ring and re-install on strainer cover.
- Replace strainer cover on strainer housing. NOTE - Tighten strainer knobs by hand only (no wrenches), hand tight.
- Verify that there are no leaks from the pump or filter. If leakage occurs DO NOT start pump. If no leakage occurs, stand at least 10 feet from pump and/or filter and proceed with next step.
- Pump is self-priming using 4" pipe. Turn on power and wait for pump to prime, which may take up to seven (7) minutes. Priming time will depend on vertical length of suction lift and horizontal length of suction pipe. If pump does NOT prime within five minutes, stop motor and determine cause. Be sure all suction and discharge valves are open when pump is running. See Troubleshooting Guide.

### **ATTENTION**

Wait five (5) seconds before re-starting pump after stopping the pump. Failure to do so may cause reverse rotation of motor and consequent serious pump damage.

Close filter manual air relief valve after pump is primed and all air is expelled from system.

## 8.3 Maintenance

- Clean strainer basket regularly. Do NOT strike basket to clean. Inspect strainer cover gasket regularly and replace as necessary.
- Hayward pumps have self-lubricating motor bearings and shaft seals. No lubrication is necessary.
- Keep motor clean. Insure air vents are free from obstruction to avoid damage. Do NOT use water to hose off motor.
- Occasionally, shaft seals must be replaced, due to wear or damage. Replace with genuine Hayward seal assembly kit.

## 8.4 Storage/Winterization

### ▲ WARNING



Separation Hazard. Do not purge the system with compressed air. Purging the system with compressed air can cause components to explode, with risk of severe injury or death to anyone nearby. Use only a low pressure (below 5 PSI), high volume blower when air purging the pump, filter, or piping.

### ATTENTION

Allowing the pump to freeze will void the warranty.

### ATTENTION

Use ONLY propylene glycol as antifreeze in your pool/spa system. Propylene glycol is nontoxic and will not damage plastic system components; other anti-freezes are highly toxic and may damage plastic components in the system.

Drain all water from pump and piping when expecting freezing temperatures or when storing pump for a long time (see instructions below).

Keep motor dry and covered during storage. To avoid condensation/corrosion problems, do NOT cover or wrap pump with plastic film or bags.

## 8.5 Storing Pump For Winterization

### ▲ WARNING



To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before draining pump. Failure to disconnect power may result in serious personal injury or death.

1. Drain water level below all inlets to the pool.
2. Remove drain plugs from bottom of strainer body, and remove strainer cover from strainer housing.
3. Disconnect pump from mounting pad, wiring system (after power has been turned OFF), and piping system.
4. Once the water is drained from pump, re-install the strainer cover and drain plugs. Store pump in a dry area.

## 9. Maintenance/Conservation - Strainer



Before touching, disconnect the electricity supply.

### ▲ WARNING

**Hazardous pressure. Before removing strainer cover, loosen or remove drain plug in strainer body and release all pressure.**

### ATTENTION

Please remember that changes in position of the valves will be made at all times with the motor switched off. Regularly check and clean the strainer basket (page 23). To remove the basket, place all valves in the “off” position.

Loosen the cover of the strainer, remove the basket and clean it under running water; “do not strike” to avoid its deterioration. To re-place the basket, introduce it gently, until it is in its original position. The transparent cover must be cleaned with water and neutral soap; “do not use detergents.” Do not place the strainer in chemicals.

**NOTICE** Do not allow pump to freeze.

Remove strainer cover to allow interior to dry out when storing for the season. When interior is dry, replace cover.

Remove drain plug when storing for season. Leave plug out until system is restarted the following season.

**ATTENTION** If the pump is switched off for long periods of time, should there be a danger of frost, the pump casing and strainer (page 23) should be emptied by loosening the emptying drain plug along with its O-ring seal. Before starting the pump, replace the drain plug and its O-ring seal. Fill the strainer with water and check with a screwdriver that the motor is not jammed (see fig. 1, page 22). If the shaft has seized up, call a qualified technician. In the event of the motor flooding, do not try to start it; call an electrician to dismount the motor in order to dry it.

To remove strainer cover, unscrew lid bolts. If necessary, use a wrench on flats when removing lid bolts.

**NOTICE** A clogged basket will cause cavitation, which will damage strainer basket, impeller, and pump. Clean weekly or each time you vacuum pool, whichever comes first.

When installing cover, clean O-Ring surface in strainer body.

Lubricate, sealing surfaces of strainer cover O-Rings and body, and threads and faces of lid bolts with petroleum jelly to prevent corrosion, improve seal, and ease maintenance.

Center strainer cover when installing it (especially when pressure testing).

Hand tighten lid bolts. When tightening, alternate back and forth between bolts to compress O-Ring evenly.

If possible, protect from weather at all times.

For storage of outdoor installation:

1. Drain system.
2. Dry as much as possible.
3. Lubricate with petroleum jelly.
4. Reassemble.
5. Leave drain plug out during storage.

## 10. Assembly/Disassembly

### ATTENTION



Before performing any operation, all valves must be in the “off” position; having checked this:

- Disconnect all power (this must be done by a licensed electrician).
- Loosen and remove the supply cables on the junction box (fig. 4, page 23).
- Release the plumbing connections.
- Empty the pump, loosening the drain plugs with their two O-ring seals.

### ATTENTION

In order to dismount and disassemble the pump, please see the detail drawing (fig. 4, page 23). In order to remove the motor from the pump casing, remove the six screws and the two screws, remove the motor with the impeller. In order to dismount the impeller loosen the screw and its O-Ring using an allen key n° 8; this way the impeller will be loose. By doing this operation the mechanical seal will be loose, too. The diffuser is already free.

### ATTENTION

**“All parts to be assembled must be clean and in perfect condition for use.”**

In order to assemble the pump:

- Assemble the mechanical seal, (fig. 4, page 23), assemble the rotary part of the seal above the back flange of the impeller by pressing until this falls into the space; the retainer will have been lubricated with water beforehand.
- Assemble the impeller on the shaft, affixing this with the screw and the O-ring using an allen key n° 8.
- At the junction of the pump with the motor, keep in mind that the diffuser flange, and all other connections, must fit into the correct space.

To order any spare parts, indication must be given of the denomination, number shown on the exploded drawing (page 23) and nameplate ratings.

## 11. Troubleshooting

SYMPTOM	PROBABLE CAUSE																	
	GROUP 1 ELECTRICAL										GROUP 2 MECHANICAL				GROUP 3 SYSTEM			
	A	B	C	D	E	F	G	H	I	J	A	B	C	D	A	B	C	D
PUMP RUNS, BUT NO WATER DELIVERED											•	•			•	•		•
NOT ENOUGH WATER DELIVERED			•	•							•		•		•	•		
NOT ENOUGH PRESSURE			•	•					•	•	•		•		•	•		
EXCESSIVE VIBRATION									•	•	•			•		•	•	
ABNORMAL NOISE									•	•	•	•		•		•	•	
PUMP STOPS	•	•	•	•	•	•	•	•		•								
OVERHEATING		•	•	•					•	•			•	•			•	

CAUSE	CORRECTIVE ACTION
<b>1. ELECTRICAL</b>	
A. NO VOLTAGE IN POWER SYSTEM	Check phase-to-phase on line side of starter contactor. Check circuit breaker or fuses.
B. NO VOLTAGE ON ONE PHASE	Check phase voltage on line side of starter contactor. Isolate open (THREE PHASE UNITS) circuit (circuit breaker, fuse, broken connections, etc.)
C. LOW VOLTAGE AT MOTOR	Running voltage across each leg of motor must be $\pm 10\%$ of nominal voltage shown on nameplate.
D. MOTOR LEADS IMPROPERLY GROUPED FOR VOLTAGE	Refer to lead grouping diagram on motor nameplate.
E. CONTROL FAILURE	Check control device, starter contactor, H-O-A selector switch, etc., for malfunction.
F. THERMAL OVERLOAD SWITCH OPEN	Check for drag or other overload.
G. INSULATION FAILURE	Check motor or windings to ground with megohmmeter.
H. OPEN WINDINGS	Check leg-to-leg with ohmmeter.
I. FREQUENCY VARIATION	Check frequency of power system. Must be less than 5% variation from motor nameplate rating.
J. WRONG DIRECTION OF ROTATION	Reverse rotation of three phase motor by interchanging any two leads. See Manufacturer's Instructions for reversing single phase motor.
<b>2. MECHANICAL</b>	
A. FLOW THROUGH PUMP COMPLETELY OR PARTIALLY OBSTRUCTED	Locate and remove obstruction. Refer to Repair Instructions for disassembly.
B. PUMP NOT PRIMED	Reprime. Inspect suction system for air leaks.
C. INTERNAL LEAKAGE	Check impeller for wear of controlled clearances. (See Repair Instructions.)
D. LOOSE PARTS	Inspect, repair.



CAUSE	CORRECTIVE ACTION
<b>3. SYSTEM</b>	
A. PRESSURE REQUIRED BY SYSTEM AT DESIGN FLOW RATE EXCEEDS PRESSURE RATING OF PUMP	Compare pump pressure and flow rate against pump characteristic curve. Check for closed or partially closed valve in discharge piping system. Reduce system pressure requirement. Increase pressure capability of pump.
B. OBSTRUCTION IN SUCTION PIPING	Locate and remove obstruction.
C. PRESSURE RATING OF PUMP EXCEEDS PRESSURE REQUIREMENT OF SYSTEM AT DESIGN FLOW RATE	Compare pump pressure and flow rate against pump characteristic curve. Inspect discharge piping system for breaks, leaks, open by-pass valves, etc. If necessary, reduce flow rate by partially closing discharge valve.
D. SUCTION LIFT EXCEEDS 10' DESIGN MAXIMUM	Locate pump closer (vertically) to water source.

## 12. Illustrations and Electrical Drawings

Figure 1

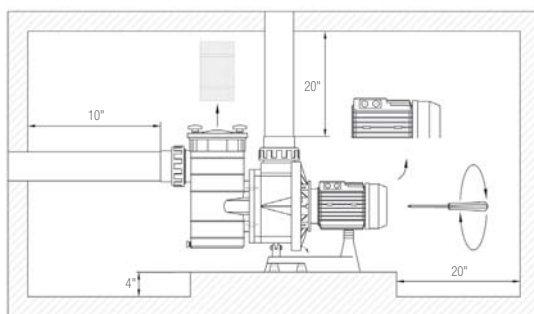


Figure 2 - 230V Connection

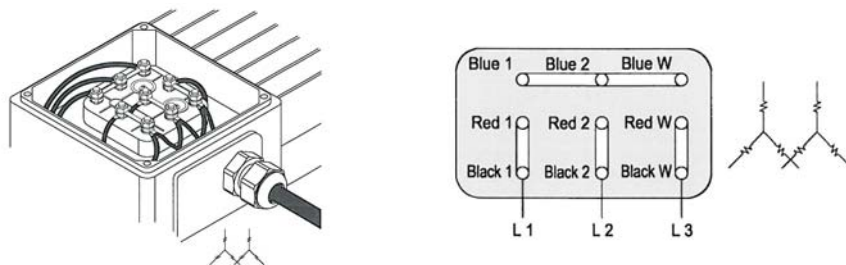
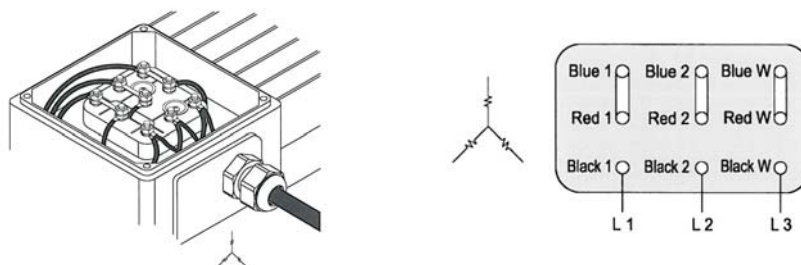


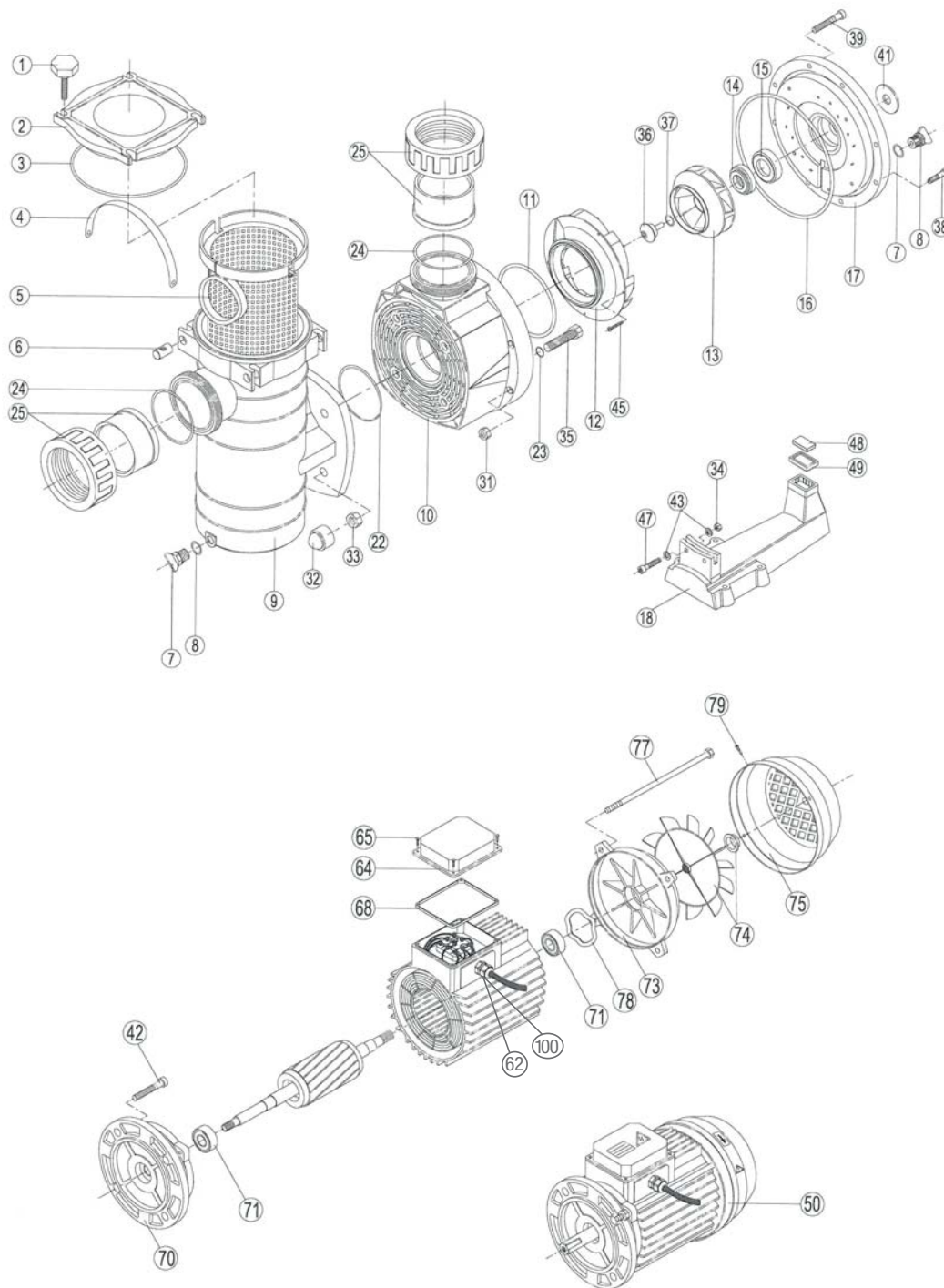
Figure 3 - 460V Connection





## 13. Exploded Diagram

Figure 4 - (see next page for Key Nos.)



Description	Included Key Nos. (Quantity of Each)	PART NUMBERS (ALL MODELS)
Lid Bolt Set	1(4), 6(4)	HCXP6000A
Pump Lid	2, 3	HCXP6001A
Filter Basket	4, 5	HCXP6002A
Internal O-Ring Set	11, 16, 37	HCXP6003A
Seal Set	11, 14, 15, 16, 37	HCXP6004A
Pump Casing	10, 22, 23(4)	HCXP6011A
Pump Support	18, 48, 49(2)	HCXP6012A
Drain Plug Set (Qty. of 10)	7(10), 8(10)	HCXP6013A
Pump Lid O-Ring (Qty. of 10)	3(10)	HCXP6014A
Diffuser O-Ring Set (Qty. of 10)	11(10)	HCXP6015A
Flange O-Ring (Qty. of 10)	16(10)	HCXP6016A
Seal Plate Set	11, 14, 15, 16, 17, 37, 41	HCXP6017A
Seal Plate Screw Set	31(8), 38(6), 39(2)	HCXP6018A
Union Connection Set (Qty. of 2)	24(2), 25(2)	HCXP6019A
Motor Mounting Screws (Qty. of 4)	42(4)	HCXP6020A
Pump Casing Bolts (Qty. of 4)	35(4), 23(4), 32(4), 33(4)	HCXP6021A
Pump Strainer Body	9, 22	HCXP6022A
Pump Support Bolt Set	34(2), 43(4), 47(2)	HCXP6023A
Electrical Connection Lid	64, 65(4), 68	HCXP6075A

FOR INDIVIDUAL MODELS		HCP55	HCP75	HCP100	HCP125
Diffuser	12, 45(8)	HCXP6005A		HCXP6006A	
Bearings Set	71(2)	HCXP6050A	HCXP6051A		
Motor Cover	73	HCXP6055A	HCXP6056A		
Fan	74	HCXP6060A	HCXP6061A		
Fan Cover	75, 79(4)	HCXP6065A	HCXP6066A		
Motor Flange	70	HCXP6070A	HCXP6071A		
Washer Set	78	HCXP6052A	HCXP6053A		
Motor Tie Rods	77(4)	HCXP6077A	HCXP6078A		HCXP6079A
Impeller	13, 36, 37	HCXP6007A	HCXP6008A	HCXP6009A	HCXP6010A
Motor	50	HCXP55MOTOR	HCXP75MOTOR	HCXP100MOTOR	HCXP125MOTOR
Strain Relief Kit	62(2), 100(2)	HCXP6024A			

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