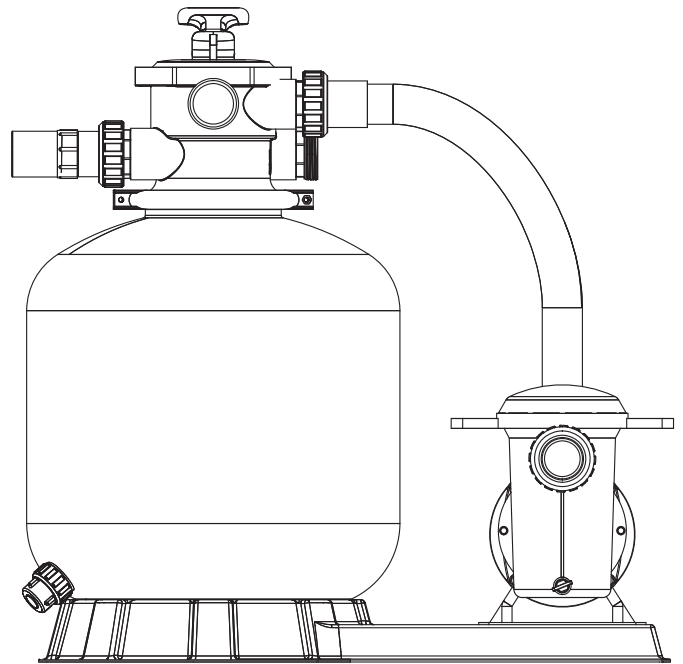


# INSTALLATION AND OPERATION MANUAL

## SAND FILTRATION COMBO

### Models

**RPSFP16, RPSFP18,  
RPSFP21, RPSFP181,  
RPSFP211**



**IMPORTANT SAFETY INSTRUCTIONS.  
READ AND FOLLOW ALL INSTRUCTION.  
SAVE THESE INSTRUCTIONS.**

**NOTE:** The instructions in this manual are for the use of qualified individuals specially trained and experienced in the installation and maintenance of this type of equipment and related system components. Installation and service personnel are required by some states to be licensed. Persons not qualified shall not attempt to install, service, or maintain this equipment.

This manual should be maintained in legible condition and kept adjacent to the sand filtration or in a safe place for future use.

**Raypak**<sup>®</sup>  
A Rheem<sup>®</sup> Company

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**Revision 4 reflects the following changes:**

Cover page text "IMPORTANT SAFETY INSTRUCTIONS, READ AND FOLLOW ALL INSTRUCTIONS and SAVE THESE INSTRUCTIONS" text size increased from 14pt (4.9 mm) to 16pt (5.6 mm). Added heading "IMPORTANT SAFETY INSTRUCTIONS and SAVE THESE INSTRUCTIONS" on page 4. Updated children's warning to "To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times" on page 4. Added to new Bonding warning and GFCI warning at the bottom on page 5. Added "SAVE THESE INSTRUCTIONS" bottom of page 6. Table A updated on page 9. Table A footer revised on page 9. Point 2 under Start-up revised on page 10. Parts List illustration updated on page 16. Table F revised on page 16. Warranty certificate revised on page 17.

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# 1. WARNINGS

## Pay Attention to these Terms

<b>▲ DANGER</b>	Indicates the presence of immediate hazards which will cause severe personal injury, death or substantial property damage if ignored.
<b>▲ WARNING</b>	Indicates the presence of hazards or unsafe practices which could cause severe personal injury, death or substantial property damage if ignored.
<b>▲ CAUTION</b>	Indicates the presence of hazards or unsafe practices which could cause minor personal injury or product or property damage if ignored.
<b>CAUTION</b>	CAUTION used without the warning alert symbol indicates a potentially hazardous condition which could cause minor personal injury or product or property damage if ignored.
<b>NOTE</b>	Indicates special instructions on installation, operation, or maintenance which are important but not related to personal injury hazards.

# 2. IMPORTANT SAFETY INSTRUCTIONS. READ AND FOLLOW ALL INSTRUCTIONS.

**▲ WARNING:** Before installing this product, read and follow all warnings notices and instructions in this manual. Failure to follow warnings and instructions can result in severe injury, death, or property damage. Please call 1-(877)-213-3726 or refer to [www.raypak.com](http://www.raypak.com) for more information related to this product.

**▲ WARNING:** Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury or loss of life.

**▲ DANGER:** Installers, pool operators and pool owners must read these warnings and all instructions before using the sand filter.

**▲ DANGER:** Serious bodily harm or death can result if this filter and pump combo is not installed and used correctly.

**▲ DANGER:** High-pressure release from the sand filter can cause severe injury or major property damage due to parts flying open or apart. Release all pressure in the sand filter before doing any work on it. For example, avoid adjusting the filter clamp under pressure as that can cause it to separate and cause serious injury or property damage.



**▲ WARNING: BEFORE WORKING ON FILTER:**  
 (1) Stop pump.  
 (2) Open air release valve.  
 (3) Release all pressure from system.

**▲ WARNING:** Risk of electrical shock. More than one disconnect switch may be required to de-energize the equipment before servicing.

**▲ WARNING:** This filter and pump combination set is intended for use in swimming pool applications.

**▲ WARNING:** Most states and local codes regulate the construction, installation, and operation of public pools and spas, and the construction of residential pools and spas. It is important to comply with these codes, many of which directly regulated the installation and use of this product. Consult your local building and health codes for more information.

**▲ WARNING:** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

**▲ WARNING:** When setting up pool water turnovers or flow rates, the operator must consider local codes governing turnover as well as disinfectant feed ratios.

**▲ WARNING:** DO NOT increase pump size; this will increase the flow rate through the system and exceed the maximum flow rate stated on the drain cover.


**▲ WARNING:** For filters intended for use in other than single-family dwellings, a clearly-labeled emergency switch shall be provided as part of the installation. The switch shall be readily accessible to the occupants and shall be installed at least 5 ft (1.52 m) away, adjacent to, or within sight of the filter.

**▲ WARNING:** To reduce the risk of electrical shock, do not use an extension cord to connect the pump to the electrical supply, use a properly located outlet instead.

**▲ WARNING:** Do not bury the electrical cord. Place the cord so as to eliminate contact to from lawnmowers, hedge trimmers, other equipment and to avoid a tripping hazard.

**▲WARNING:** A pool or spa pump must be installed by a qualified pool and spa service professional in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation may cause an electrical hazard which could result in death or serious injury to pool users, installers, or others due to electrical shock, and also cause property damage.

**▲WARNING:** Pumps are not a substitute for properly installed and secured pool drain covers. An ANSI/ASME A112.19.8 approved anti-entrapment drain cover must be used for each drain. Pools and spas should utilize a minimum of 2 drains per pump. If a drain cover becomes loose, broken, or is missing, close the pool or spa immediately and shut off the pump until an approved anti-entrapment drain cover is properly installed with the manufacturer's supplied screws.

 **▲DANGER: ELECTROCUTION OR ELECTRICAL SHOCK RISK. DISCONNECT ELECTRICITY BEFORE WORKING ON PUMP, OR SHOCK, BURN OR ELECTROCUTION CAN RESULT.**  
Always disconnect pool pump power at the circuit breaker before servicing the pump. Death or serious injury to service people, pool users or others due to electric shock could result from failure to avoid the high danger risk.

**NOTE:** Always turn off all power to the pool pump before installing the cover or working on any suction outlet.

**▲WARNING:** Never work on the pump while it is running or the power is still connected. High voltage and cause serious or fatal injury. A suitable ground fault interrupter (GFCI) should always be installed at the power supply source of this unit. Article 681-31 of the NEC requires that a GFCI be used if this pump is used with a storage pool. Be sure to ground the motor before connecting to electrical AC power source. Failure to ground the motor can cause serious or fatal electrical shock hazard. **DO NOT** ground to a gas supply pipe line.

**NOTE:** This pump operates with electrical voltage, and can generate both vacuum and pressure in the water system. When properly wired and plumbed, this pump will operate in a safe manner.

**▲CAUTION:** This pump is for use with permanently installed pools and may also be used with hot tubs and spas. Do not use with storable pools unless the pump is protected by a factory-installed double-insulated enclosure. 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:** Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or operate swimming pools, spas, or hot tubs if a suction outlet cover is missing, broken, or loose.


**▲CAUTION:** Elevated water temperature can be hazardous. The U.S. Consumer Product Safety Commission has these guidelines:

1. Spa water temperatures should never exceed 104°F (40°C). A temperature of 100°F (38°C) is considered safe for a healthy adult. Special caution is suggested for young children.
2. Drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness and subsequently result in drowning.
3. Pregnant Women Beware! Soaking in water over 102°F (39°C) can cause fetal damage during the first three months of pregnancy resulting in the birth of a brain-damaged or deformed child.
4. Before entering the spa or hot tub, users should check the water temperature with an accurate thermometer; spa or hot tub thermostats may err in regulating water temperatures by as much as 4°F (2.2°C).
5. Persons with a medical history of heart disease, circulatory problems, diabetes, or blood pressure problems should obtain a physician's advice before using pools or hot tubs.
6. Persons taking medications which induce drowsiness, such as tranquilizers, antihistamines, or anticoagulants, should not use spas or hot tubs.

**▲WARNING:** To reduce the risk of electrical shock, replace any damaged electrical cord immediately.

**NOTE:** Always turn off all power to the pool pump before installing the cover or working on any suction outlet.

**▲DANGER:** For continued protection against possible electrical shock, this unit is to be mounted to the base in accordance with the installation instructions.

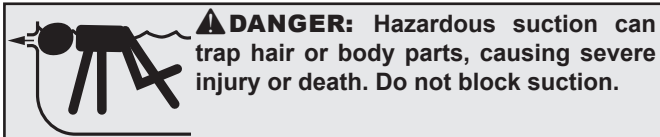
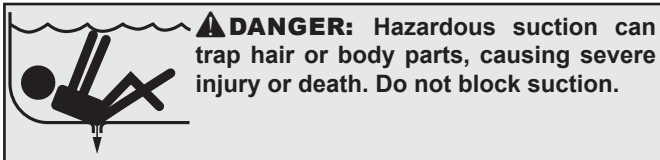
 **▲DANGER:** Hazardous suction can trap hair or body parts, causing severe injury or death. Do not block suction.

**▲WARNING:** Risk of Electric Shock. 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. The 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.

### 3. IMPORTANT SAFETY INSTRUCTIONS

#### Entrapment Prevention

**▲ DANGER: DO NOT BLOCK SUCTION.**



**SUCTION HAZARD.** Suction can cause serious injury or death. Do not use this pump for wading pools, shallow pools, or spas containing bottom drains, unless pump is connected to at least two functioning suction outlets.

**▲ WARNING:** Pump suction is hazardous and can trap and drown or disembowel bathers. Do not use or operate swimming pools, spas, or hot tubs if a suction outlet cover is missing, broken, or loose.

The following guidelines provide information for pump installation that minimizes the risk of injury to users of pools, spas, and hot tubs:

#### Entrapment Protection

The pump suction system must provide protection against the hazards of suction entrapment.

#### Suction Outlet Covers

All suction outlets must have screw-fastened covers installed. All suction outlet (drain) covers must be maintained. Drain covers must be listed/certified to the latest published edition of ANSI/ASME A112.19.8 (ANSI/APSP-16, 2011). They must be replaced if cracked, broken, or missing.

#### Number of Suction Outlets Per Pump

Provide at least two hydraulically-balanced main drains, with covers, as suction, for each circulating pump suction line. The centers of the main drains (suction outlets) on any one suction line must be at least 3 ft (.9 m) apart, center to center.

The system must be built to include at least two suction outlets (drains) connected to the pump whenever the pump is running. However, if the two main drains run into a single suction line, the single suction line may be equipped with a valve that will shut off both main drains from the pump. The system shall be constructed such that it shall not allow for separate or independent shutoff or isolation of each drain.

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

#### Water Velocity

The maximum water velocity through the suction fitting or cover for any suction outlet must be 1.5 ft (.5 m) per second, unless the outlet complies with the latest published edition of ANSI/ASME A112.19.8 (ANSI/APSP-16, 2011), the standard for Suction Fittings For Use in Swimming and Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications. In any case, do not exceed the suction fitting's maximum designed flow rate.

If 100% of the pump's flow comes from the main drain system, the water velocity in the pump suction hydraulic system must be 6 ft (1.8 m) per second or less, even if one main drain (suction outlet) is completely blocked. The flow through the remaining main drain(s) must comply with the latest published edition of ANSI/ASME A112.19.8 (ANSI/APSP-16, 2011), the standard for Suction Fittings For Use in Swimming and Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.

#### Testing and Certification

Suction outlet covers must have been tested by a nationally-recognized testing laboratory and found to comply with the latest published edition of ANSI/ASME A112.19.8 (ANSI/APSP-16, 2011), the standard for Suction Fittings For Use in Swimming and Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Applications.

#### Fittings

Fittings restrict flow; for the best efficiency, use the fewest possible fittings (but at least two suction outlets).

Avoid fittings that could cause an air trap.

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

**SAVE THESE INSTRUCTIONS.**

## 4. OVERVIEW

**▲WARNING:** This filter operates under high pressure. When any part of the circulating system (e.g., clamp, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid or control valve to separate which may result in serious injury, death, or property damage. To avoid this potential hazard, follow these instructions.

Before any service to the circulating system (repositioning valves, beginning the assembly, disassembly, clamp adjustment, etc.):

- a. Turn off electricity going both to the pump off and to any automatic controls to avoid accidental system start-up during servicing;
  - b. Open manual air relief valve;
  - c. Wait until the pressure gauge reads zero (0) to ensure all pressure is gone.
1. When, or if, installing the filter clamp, follow the filter valve and clamp installation instructions exactly.
  2. Follow the system restart instructions exactly after service on the circulation system is complete.
  3. Maintain circulation system proactively. Damaged and worn parts must be replaced immediately (e.g., clamp, pressure gauge, relief valve, O-rings, etc.).
  4. Mount the filter properly and position it according to all provided instructions.

**▲WARNING:** Failure to operate your filter system, or inadequate filtration, can cause poor water clarity obstructing visibility in your pool. Poor water clarity may obscure objects while swimming which, while swimming and diving, could cause serious personal injury or death. Never swim in a pool with poor water clarity.

### Filter

The sand filter is designed to last for years of use when maintained properly. Its purpose is to extract suspended particles (dirt) from the pool water to keep the water clear. A special filter sand is used to trap and collect the particles. The filtering action occurs as the water flows through the unit, and the particles are trapped in the sand bed which form the filter.

In terms of layout, water enters through a valve on the top of the filter and then passes evenly through the filter. The filtered water then exits through the bottom side of the filter, up through the stand pipe, through a valve on the top, and then back into the pool through piping or hoses.

In terms of capacity, please ensure the volume of water cleaned in every 24-hour cycle is, at minimum, at least double the total volume in the pool so proper cleaning can occur.

After time, enough particles will have collected in the filter sand to impede the easy flow of water through it and this resistance will cause the filter pressure to build to such a point that the filter needs cleaning (purging). That process is called backwash.

The backwash procedure reverses the flow of water through the filter to flush out the particles and discharge them, not back into the pool, but into a waste line. A valve on the unit top is set to BACKWASH. This is a manual procedure. After running the BACKWASH cycle, reset the valve to FILTER manually to resume normal filtration.

The sand filter, while designed to remove particles and/or other debris suspended in the water, does not adjust the pH level or the bacterial count.

Sanitation and pH balancing are specialized and important areas that are covered with other tools, equipment and knowledge and as such are beyond the scope of the manual. Roughly speaking, pH level should be in the range of 7.2~7.6, and chlorine about 1~2 ppm, but much more goes into water chemistry than this. Check the local codes and with pool service specialists for required instruction.

### Constant Speed Pump Models

This above-ground pool centrifugal pump is designed to operate for years with proper maintenance. The pump body, trap with basket, diffuser and impeller are made from high quality thermoplastic materials. These materials are made using corrosion-resistant materials. When installed, operated and maintained in accordance with these instructions, your pump will provide years of service.

These pumps are driven by an electric motor which is directly attached to an impeller. When the electric motor turns, the impeller turns too, moving water from the trap inlet to the outlet for water circulation. The trap basket stops debris from going into the pump to protect the impeller. It has a transparent lid cover which can be opened for cleaning out the trap.

### Dual-Speed Pump Models

Some of the pumps feature both high-speed and low-speed settings. At low speed, the pump runs at half of the high speed rate and thus has a different performance curve. In low-speed mode, the electrical energy savings are 60%, based on an equal amount of circulated water.

Switch the motor to low speed for quiet operation and electrical cost savings if circulation turnover time is not a critical consideration. Expect that minor adjustments may be required with the automatic chlorine dispenser, the skimmers and the heater due to the lower flow. Refer to the manual as necessary.

High-speed mode is ideal for vacuuming the pool, quick filtering action, priming the system, and to keep up with heavy bathing use.

## 5. INSTALLATION

**⚠ WARNING:** Blockage of suction fittings can cause serious or fatal injury due to drowning. To reduce the risk of injury, do not permit children to use this product.

**⚠ WARNING:** Never work on the pump while it is running or power is still connected. High voltage can cause serious or fatal injury. A suitable ground fault interrupter (GFCI) should always be installed at the power supply source of this unit. Article 681-31 of the NEC requires that a GFCI be used if this pump is used with a storage pool. Be sure to ground the motor before connecting to electrical AC power source. Failure to ground the motor can cause serious or fatal electrical shock hazard. DO NOT ground to a gas supply pipe line.

**⚠ DANGER:** High-pressure release from the sand filter can cause severe injury or major property damage due to parts flying open or apart. Release all pressure in the sand filter before doing any work on it. For example, avoid adjusting the filter clamp under pressure as that can cause it to separate resulting in serious injury or property damage.

**⚠ WARNING:** The system's centrifugal pump operates with electrical voltage, and can generate both vacuum and pressure in the water system. When properly wired and plumbed, this pump will operate in a safe manner.

**⚠ WARNING:** Chemical fumes and/or spills can cause serious corrosion to the filter and pump structural components. Structurally-weakened components can cause filter, pump or valve attachments to separate and could cause serious bodily injury or property damage.

### Pump

1. Only qualified, licensed personnel should install pump and wiring.
2. Electrical Contractors Please Note: All 115VAC 60Hz pumps must be wired to the main power supply through an approved and correctly-rated contactor.
3. Allow for gate valve in suction piping.

Pump suction and discharge connections have molded in thread stops, do not try to screw pipe in beyond these stops.

### Pump Mount

- Must be on a solid, level, rigid and vibration-free surface.
- Ensure pump suction inlet height to be as close to pool water level as possible. Ensure the use of a short, direct suction pipe, to reduce friction losses.
- Avoid installing the pump above the water level. Suction lifts of more than 6" (152 mm) will cause

very long priming times, and potentially damage the pump.

- Allow for gate valves in the suction and discharge piping. Ensure adequate floor drainage to prevent flooding.
- Protect from excess moisture.
- Ensure adequate access for servicing the pump, filter, and piping.

### Packaging

A hose barb kit and union kit are included and needed to make the connections.



Figure 1. Connection Kits

### Pump Assembly Steps

1. The system should be installed as close as possible to the swimming pool and preferably at a level of 20" (0.5 m) below the level of the water in the swimming pool. It should be preferably in a dry, well-ventilated area away from direct sunlight and on a hard, level surface. Make sure there is drainage available at the place where the filter is to be installed. Give consideration to:
  - a. Drainage far away from pump.
  - b. Ventilation of the pump motor.
  - c. Access for future servicing and winterizing.
2. Bolt the pump onto the platform.
3. Connect the suction and discharge pipes to the outlet and inlet of the swimming pool.
4. The pump motor must be wired in accordance with the wiring diagram supplied with the motor using the right voltage. Wiring the motor with the incorrect voltage will cause damage to the motor. Such damage will not be covered under warranty.
5. Install, ground and bond wire according to local or National Electrical Code requirements.
6. Permanently ground the motor. Locate the ground terminal located on the rear side of the motor and use the wire gauge and type required by code to connect the motor ground terminal to the electrical service ground. On cord-connected circuits, check for proper grounding.



7. Bond permanently-wired pumps. The National Electrical Code requires that the motor be electrically bonded to the appropriate permanently-installed pool or spa/hot tub structure using a solid copper conductor no smaller than No. 8 AWG. The bonding wire should be connected from the accessible wire connector on the motor shell 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 of the inside walls of a swimming pool, spa or hot tub. A grounding lug is provided on the exterior of the motor shell for this purpose.

## Filter Assembly

Common tools such as screwdrivers, wrenches, and consumables like pipe sealant for plastic adapters are required for the installation and service of the sand filter. See the schematic for layout information, **Figure 4**.

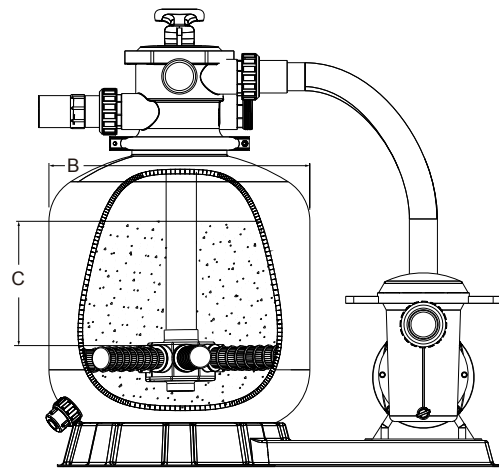
## Pouring Sand Filter Sand Media

1. The filter should be placed on a level concrete slab, very firm ground, or equivalent. Locate the filter so that the piping connections, control valve are convenient and accessible for operation and service.
2. Filter sand media is loaded through the top opening of the filter as follows:
  - a. Loosen the flange clamp and remove the filter control valve (if previously installed).
  - b. Cap the internal pipe with a plastic cap to prevent sand from entering it.
  - c. We recommend filling the tank approximately 1/2 full with water to provide a cushioning effect when the filter sand is poured in. This helps protect the under-drain laterals from excessive shock.

- d. Carefully pour in the correct amount and grade of filter sand. (Be sure the center pipe remains centered in opening.) When done, the sand surface should be leveled and should come to about the middle of the filter tank. Remove the plastic cap from the internal pipe.

## Filter Control Valve Assembly

1. Assemble the filter control valve in the filter tank.
  - a. Insert the filter control valve (with O-ring in place) into the tank neck, taking care that the center pipe slips into the hole at the bottom of the valve.
  - b. Place two plastic clamps around the valve flange and tank flange and tighten just enough so that the valve may be rotated on the tank for final positioning.
  - c. Carefully screw the pressure gauge (with O-ring in place) into the tapped hole in the valve body. Do not over-tighten.



**Figure 2. Dimensions**

Combo Model	RPSFP16	RPSFP18	RPSFP21	RPSFP181	RPSFP211	
Filter Model	RPSF16	RPSF18	RFSF21	RPSF18	RFSF21	
Pump Model	RPAGP75	RPAGP100	RPAGP150	RPAGP102	RPAGP152	
Power (HP)	0.75	1	1.5	1	1.5	
Speed	Single			Dual		
Max Operating Pressure, PSI (bar)	28 (2)					
Max Flow Rate Pump + Filter, GPM (LPM)	50 (187)	63 (237)	68 (258)	63 (237)	68 (258)	
Turnover Rate, Gal. (L)	2 Hours	6000 (22680)	7560 (28577)	8160 (30845)	7560 (28577)	8160 (30845)
	4 Hours	12000 (45360)	15120 (57154)	16320 (61690)	15120 (57154)	16320 (61690)
	6 Hours	18000 (68040)	22680 (85731)	24480 (92535)	22680 (85731)	24480 (92535)
Valve Port	1.5"					
Filter Dia., in (mm), "B"	15.7 (399)	17.7 (450)	20.7 (526)	17.7 (450)	20.7 (526)	
Silica Height, in (mm), "C"	6.9 (175)	8.3 (211)	9.3 (235)	8.3 (211)	9.3 (235)	
Silica 16/30* Weight, lb (kg)	77 (35)	99 (45)	209 (95)	99 (45)	209 (95)	

\*Suggested silica weight is for reference only and based on recommended filter media. Weight will vary based on type and size of media used.  
Recommended Filter Media: 16/30 Mesh Silica Sand / Silica #20 (0.5 - 0.8mm diameter)

**Table A. Specifications**

- d. Connect the pump to the control valve opening marked PUMP. After connections are made, tighten the valve flange clamps with the screwdriver, tapping around the clamp with the screwdriver handle to help seat the valve flange clamp.
2. Make the connection from the pool pipe to the control valve opening marked RETURN, and complete the other necessary plumbing connections such as the suction lines to the pump, waste line, etc.
3. Make the electrical connections to the pump, per pump instructions.
4. To prevent water leakage, make sure all pipe connections are tight.

## Valve Key Assembly

1. Place the valve key so that wedge opening is at TOP port. See handle in **Figure 4**. The flat edge of the cover screw lug should align with the flat edge of the body screw lug.
2. Position the cover O-rings.
3. Secure the assembly to the body with the cover screws. Tighten the cover screws evenly and alternately. Do not over-tighten.

## 6. START-UP

**⚠ WARNING:** NEVER run the pump dry! Running the pump dry may damage seals, causing leakage and flooding! Fill the pump with water before starting the motor. These pumps cannot self-prime.

**⚠ WARNING:** Do not block pump suction! To do so with body may cause severe or fatal injury. Children using pool must ALWAYS have close adult supervision.

### **CAUTION:** Before removing the lid:

- **STOP THE PUMP** before proceeding.
- **CLOSE THE GATE VALVES** in the suction and discharge pipes.
- **RELEASE ALL PRESSURE** from the pump and piping system.
- **NEVER** tighten or loosen screws while the pump is in operation.

## Priming Pump

1. Release all air from the filter and piping system (see filter instructions below).
2. In a flooded suction system (water source higher than the pump) the pump will prime itself when the suction and discharge valves are opened.
3. If the pump is not in a flooded suction system, unscrew and remove the trap cover; fill the trap and

pump with water.

4. Clean and inspect the O-Ring; re-install it on the trap cover.
5. Replace the trap cover on the trap; turn clockwise to tighten the cover.

**NOTE:** Tighten the trap cover by hand only. The pump should prime now. Priming time will depend on vertical length of suction lift and horizontal length of suction piping.

## Initial Start-Up

**NOTE:** During initial clean-up of the pool water, it may be necessary to backwash more frequently due to a possibly unusually-heavy initial dirt load in the water.

**⚠ WARNING:** Always turn the pump off before changing valve positions. Changing valve positions while the pump is running can damage the control valve, which may cause serious injury or property damage.

1. Make sure the correct amount of filter media (specified sand) is put into the tank and that all connections have been connected and secured.
2. Depress the multiport valve handle and rotate it **CLOCKWISE** (right) to the **BACKWASH** position. Always depress the valve handle before turning it to prevent damage to the multiport valve seal.
3. Prime and start the pump according to the pump priming instructions above. Make sure all suction and return lines are open to allow the filter tank to fill with water.

**NOTE:** Tighten the trap cover by hand only. Pump should prime now. Priming time will depend on vertical length of suction lift and horizontal length of suction piping.

4. Once water is flowing out of the waste line, run the pump for at least 1 minute. An initial backwash of the filter is recommended to remove any impurities or fine sand particles in the sand media.
5. Turn the pump off and set the multiport valve to the **RINSE** position. Start the pump and operate it until the water in the view glass is clear, about 30 seconds to 1 minute. Turn the pump off and set the valve to **FILTER** position and restart the pump. The filter is now operating in the normal filter mode, filtering dirt particles from the pool water.
6. Adjust the pool suction and return valves to achieve the desired flow. Check the system and filter for water leaks and tighten connections, bolts and nuts, as required.

- Note the initial pressure gauge reading when the filter is clean. It will vary from pool to pool depending upon the pump and general piping system. Over time, as the filter removes dirt and impurities from the pool water, the accumulation of dirt in the filter will cause the pressure to rise and diminish the water flow. When the pressure gauge reading is 8-10 PSI higher than the initial "clean" pressure you noted, it is time to backwash the filter (see BACKWASH under filter and control valve functions).

with water and put it back in the trap (pre-filter) with the large opening facing the pipe connection port. If the basket is put in backwards, the cover will not fit on the trap body.

- Clean and inspect the lid.
- Clean the O-ring and its groove on the trap body (pre-filter) and replace the lid. To help keep the lid from sticking, tighten by hand only.
- Prime the pump (see priming instructions above).

## 7. GENERAL MAINTENANCE

**NOTE:** It is essential to set up a regular schedule to clean the sand filter by BACKWASHING and RINSING to provide clean, safe and healthy swimming water. The time between cleaning and the length of cleaning time will depend on size of pool, bather usage and other environmental conditions. Consult your local pool professional to work out a program that best suits your pool.

### Pump

**⚠ WARNING:** To prevent damage to the pump and for proper operation of the system, clean the pump strainer and skimmer baskets regularly.

The only routine maintenance needed is inspection and cleaning of the trap basket (pre-filter basket). Debris or trash that collects in the basket will reduce or stop water flow through the pump. Follow the instructions below to clean the trap.

- Stop the pump, close the suction and discharge gate valves, and release all pressure from system before proceeding.
- Unscrew the trap lid (pre-filter lid) by turning it counterclockwise.
- Remove the strainer basket and clean it. Be sure all holes in basket are unobstructed. Flush the basket

### Filter

It is important to maintain a regular service schedule program with pool equipment to ensure the best operation and the longest lasting results. Regular maintenance can identify any potential issues early and save on expensive maintenance at a later date, see **Table B**.

### Filter and Control Valve Functions

Information is provided in **Figure 3** and **Table C** for using the control valve to regulate all the filter functions.

### General

A boss with pipe tap is provided for installing the optional influent pressure gauge.

### Valve Service

Stop the pump, close the suction and the discharge gate valve before proceeding:

- Set the handle in filter position.
- Remove the cover screws.
- Lift the cover and key assembly out.

Period	Check Point	Related Problems
Weekly	Check pressure gauge	If pressure increases by 8-10 PSI, then backwash and rinse the filter as per instructions.
Quarterly	Check all gaskets and pressure gauge.	Isolate and turn off the pump. Remove all gaskets and turn over. You can also apply a silicone-based grease to extend gasket life. If dry, then contact your local pool professional for replacement.
	Check around the unit for leaves, debris or signs of flooding.	Replace any debris that is restricting air circulation around the filter. If in a flood prone location, rectify.
	Check for any insects, ants etc.	It is a good practice to use a good-quality surface spray around your equipment. Make sure all units are turned off and then spray around all units to eliminate any insects/ants, etc.
	Check for any leaks	If you notice any water leaking from the filter or other equipment, check the gaskets first and reseal. If leaks continue, contact your local pool professional to assess and rectify.

**Table B. Maintenance Service Schedule**

## Cleaning

**⚠ WARNING:** Failure to operate your filter system, or inadequate filtration, can cause poor water clarity obstructing visibility in your pool. Poor water clarity may obscure objects in the water which while swimming and diving could cause serious injury or death. Never swim in a pool with reduced water clarity.

Cleaning your filter will give you better quality water that is clean, clear, and safe for swimming. It is highly recommended to clean on a regular basis. Monitor the pressure gauge and to switch on BACKWASH when an increase of 8-10 PSI is noted compared to your clean filter's pressure gauge reading.

## Filter Backwash Procedure

**⚠ WARNING:** To prevent equipment damage and possible injury, always turn the pump off before changing valve position.

**⚠ WARNING:** Do not unscrew the screws of the flange clamp while the pump is running.

Perform the backwash operation as follows:

1. Turn the pump off.
2. Change the position of the multiport valve handle from FILTER to BACKWASH
3. Power up the pump again. The water flow is automatically reversed through the filter so the water is directed from the bottom of the tank, up through the sand, thereby flushing the trapped dirt and debris out into the waste line.
4. Check through the visual sight glass on the multi-function valve outlet. The duration of the backwash operation will depend on how dirty your filter is.

Continuously check the sight glass to see when the water becomes clear, after which the pump is turned off.

5. Change the position of the multiport valve handle from BACKWASH to RINSE.
6. Turn the pump back on. The water flow will now be directed through the sand bed and then out through the waste line. This will settle the sand bed properly for normal operation.
7. Continue checking the sight glass until the water is clear, usually about half the time of the backwash cycle.
8. Turn the pump off.
9. Change the position of the multiport valve handle from RINSE to FILTER.
10. Turn the pump on.

## Chemical Cleaning

Algae load, calcification, sanitation, and other poor water conditions will affect the proper function and efficiency of the filter. Follow local guidelines and pool professional advice to optimize these other key facets of water quality that the filter does not control, but is impacted by.

## Filter Winterizing

**⚠ CAUTION:** Allowing water to freeze in the system will damage the system and cause potential water damage, flooding and property damage.

**⚠ CAUTION:** The Multiport Valve should be left in the "Winterize" position during the shutdown season so the rubber seal of the valve diverter has no pressure on it. Failure to do so can damage the valve diverter seal which can cause property damage from leaking water.

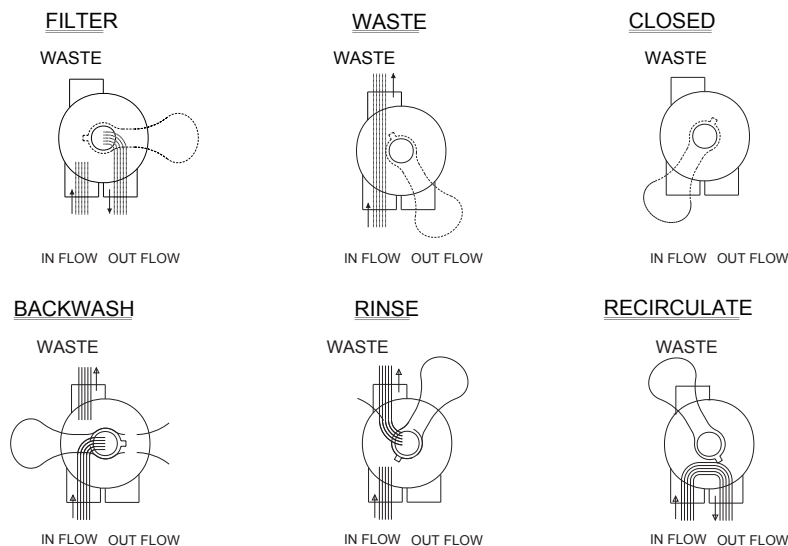


Figure 3. Multiport Valve Position Functions

**CAUTION:** Do not use anti-freeze solution except Propylene Glycol, as the other anti-freeze are highly toxic and will damage the pump.

Winterizing is a process for protecting your sand filter during freezing conditions which can damage all pool filtration equipment resulting from ice expansion (water expands as it freezes).

It is highly recommended to take the following steps when preparing your filter for winter conditions:

1. Backwash the filter for at least 30 minutes before closing down the pool for winterizing. This will clean the filter bed thoroughly and remove any debris from the system.
2. Remove the drain cap at the bottom of the filter tank to drain the tank. Leave the cap off during winter.
3. Set the control valve handle between the RINSE and FILTER. This will lift the handle and help with the draining process by allowing air to enter into the tank.
4. Unscrew the pressure gauge from the control valve and store the pressure gauge indoors.
5. Drain and winterize the pump according to the pump instructions.
6. This is an ideal time for any repairs required during the off-season. Most pool professionals have recommendations of what will be needed before the next pool season.

## Pump Winterizing

**CAUTION:** The pump must be protected when freezing temperatures are expected. Allowing the pump to freeze will cause severe damage. Such damage will not be covered under warranty.

There are two options when winterizing the pump:

### Option 1

1. Drain all the water from the pump, system equipment, and piping.
2. Remove the drain plugs. Do not replace the plugs; store them in the empty strainer basket for winter.
3. Keep the motor covered and dry.

### Option 2:

1. Drain all the water from the pump, system equipment, and piping.
2. Remove the pump and motor from the plumbing and store indoors in a warm and dry location.

**NOTE:** When the winter season is over the pump will need to be primed prior to start. Refer to Section 5. Start-Up.

Valve Position	Function
<b>FILTER</b>	This is the standard normal operation position of your filtration system. The water flows in from your pool and is distributed across the top of the sand bed in the filter. Through pressure, this water then flows down through the sand allowing debris to be removed from the water and collected in the sand bed. Water is then routed up through the laterals and the center stem pipe and is returned to the pool, usually via some form of sanitation and/or heating. The FILTER position can also be used for manual vacuuming and cleaning.
<b>BACKWASH</b>	This position is used when your sand filter's sand bed needs cleaning. Use the pressure gauge to monitor when this is required, usually 8-10 PSI above the operation of a clean filter. When BACKWASH is selected, the water flow is reversed and goes down the stem pipe and out through the laterals. This lifts the sand bed and allows debris to be taken out of the filter and through the waste pipe. The sight glass will show the quality of the water. Continue BACKWASH until the water visually clears.
<b>RINSE</b>	This setting is used after completing the BACKWASH cycle. In the RINSE setting, water is taken from the pool and distributed on the sand bed. This downward flow settles the sand bed, disturbed from backwashing, and carries any remaining loose dirt through the waste line. By using RINSE after backwashing, you will eliminate any debris from returning to the pool water. Rinse until you see clear water through the transparent sight glass. Time needed is about half the time of a BACKWASH cycle.
<b>WASTE</b>	The WASTE position allows you to pump excess water from the pool directly down through the waste pipe. This position is useful after heavy rains when the water level is too high. Water is directed straight through the multiport control valve and bypasses the filter, going directly to waste. You can also use this position to vacuum heavy concentration of debris from the pool.
<b>RECIRCULATE</b>	Similar to the WASTE setting, RECIRCULATE allows the water to bypass the filter but go straight back to the pool. This is a useful setting if you have applied some chemicals that need to be circulated, but not removed by the filter. In addition, if a leak develops in the filter, use recirculate to continue circulating water until leaks are located for fixing.
<b>CLOSED</b>	The CLOSED setting acts like a valve and prevents the flow of water through the tank, and is particularly useful when doing any maintenance on the filtration system.

**Table C. Multiport Valve Position Functions**

## 8. TROUBLESHOOTING

### Filter

The table below identifies some of the main issues that may be encountered with your sand filter. This should assist in solving most of the major problems. It is highly recommended that regular maintenance of your swimming pool equipment, including the sand filter, be performed by a qualified pool professional. This will extend the life of your equipment and give you the best performance.

Problem	Cause	Action
Sand entering the pool	Sand size is too small and getting through laterals	Change sand
	Flow rate on the pump is too high and pushing sand through laterals	Adjust flow rate
	Sand bed calcified due to poor water chemistry	Adjust chemistry (pH balance)
	Broken lateral	Repair
	Loose center-pipe	Re-tighten
	Too much sand in the tank	Reduce sand level
	Multiport valve not correctly positioned in the filter	Remove and reattach correctly
	Too much air in the filter	Purge air
Sand coming out of waste line	Flow rate on the pump is too high and lifting sand too high during backwash	Adjust flow rate, change the pump as needed
Pool water is cloudy due to poor filtering	Sand bed is dirty and requires backwashing	Backwash to remove dirt
	Incorrect sand has been installed	Replace with correct specification
	Algae build-up in the filter due to poor water chemistry	Adjust chemistry (chlorine)
	Calcified sand bed due to poor water chemistry	Adjust chemistry (pH balance)
	Heavy swimmer usage	Backwash more frequently
	Flow rate on the pump is incorrect for filter size and pool size	Adjust flow rate, change the pump as needed
	Backwashing cycle is too short	Increase backwash cycle length
	Backwash line is too small restricting water flow	Increase pipe size
Filter leaking water	Tank cracked	Replace
	Drain plug not tight	Re-tighten
	Valve to tank O-ring damaged	Replace
Multiport control valve leaks	Handle is not properly located in selected setting	Re-assemble correctly
	Valve to tank O-ring damaged	Replace
	Valve cover O-ring damaged	Replace
	Pressure gauge O-ring damaged	Replace
Abnormal loss of pool water	Leak inside control valve	Re-tighten or replace as needed
	Leak from pool or PVC piping	Inspect, repair, replace
High pressure filter	Filter requires backwashing	Backwash
	Calcified sand bed due to poor water chemistry	Adjust chemistry (pH balance)
	Return lines too small for pump flow rate	Increase pipe size
Low pressure in filter	Multiport control valve incorrectly set	Re-assemble correctly
	Pump flow rate is too slow	Check speed and control valves
	Air leak in pump suction	Check seals and tighten as needed

**Table D. Troubleshooting Guide, Filter**

# Pump

Problem	Cause	Action
Motor Does Not Start	Switch or circuit breaker is in OFF position	Turn to ON position
	Fuses blown or thermal overload open	Replace fuses
	Locked motor shaft	Replace the pump
	Motor windings burned out	Replace the pump
	Defective starting switch inside single-phase motor	Replace the pump
	Disconnected or defective wiring	Repair wiring
	Low voltage	Call an electrician
Pump Does Not Reach Full Speed	Low voltage	Call an electrician
	Pump connected to the wrong voltage	Call an electrician
Motor Overheats (Circuit Breaker Trips)	Low voltage	Call an electrician
	Motor windings connected to the wrong voltage on dual-voltage models	Call an electrician
	Inadequate ventilation	Relocate the pump
Pump Delivers No Water	Pump is not primed	Prime the pump
	Closed valve in suction or discharge line	Open the valve
	Leakage or air into suction system	Call a plumber
	Impeller clogged	Disassemble pump, clear obstruction
Leakage Of Water At Shaft	Shaft seal requires replacement	Replace seal
Low Pump Capacity	Valve in suction or discharge line partly closed	Open or replace the valve
	Suction or discharge line partly plugged	Clear the obstruction
	Suction or discharge line too small	Re-plumb with larger pipe diameter
	Plugged basket in skimmer or hair and lint strainer	Clean the basket
	Dirty filter	Clean the filter
	Impeller clogged	Disassemble pump
High Pump Pressure	Discharge valve or inlet fittings closed too much	Readjust or replace
	Return lines too small	Re-plumb with larger pipe diameter
	Dirty filters	Clean filter
Noisy Pump And Motor	Plugged basket in skimmer or hair in lint strainer	Clean basket
	Worn motor bearings	Replace the pump
	Valve in suction line partly closed	Readjust the valve
	Suction line partly plugged	Clean or remove the plug
	Vacuum hose plugged or too small	Clean or remove the plug
	Pump not supported properly	Examine or replace the base
Air Bubbles At Inlet Fittings	Leakage of air into suction line at connections or valve stem	Call a plumber
	Cover gasket of hair and lint strainer needs cleaning	Clean the cover gasket
	Low water level in pool	Refill pool

**Table E. Troubleshooting Guide, Pump**

## 9. ILLUSTRATED PARTS LIST

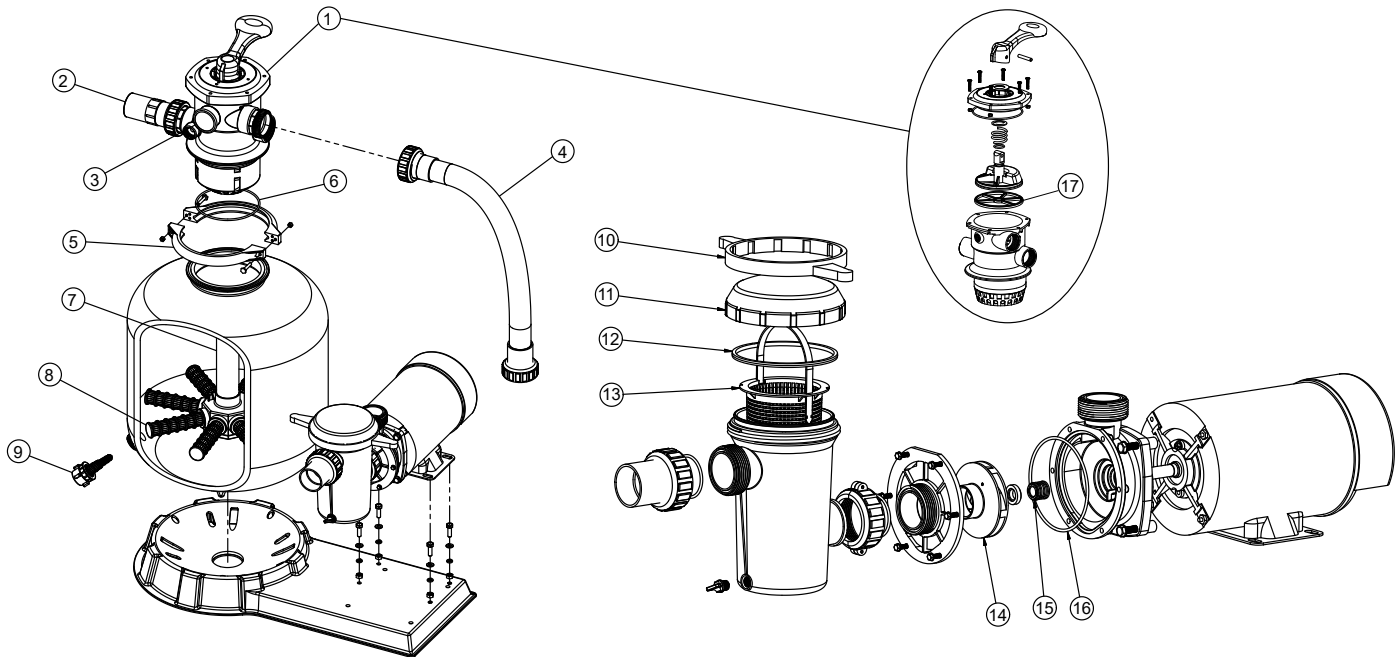


Figure 4. Sand Filter with Pump Exploded View

Item	Description	Raypak Order No.
1	Kit - 6-Way Valve 1-1/2"	018214F
2	Kit - Union with Sight Glass and Pressure Gauge	018253F
3	Kit - Plastic Hose with Nut RPSF14 - RPSF18	018254F
4	Kit - Plastic Hose with Nut RPSF21	018255F
5	Kit - Locking Clamp	018215F
6	Kit - Lateral Assy with Center Pipe RPSF16	018217F
7	Kit - Lateral Assy with Center Pipe RPSF18	018218F
	Kit - Lateral Assy with Center Pipe RPSF21	018219F
8	Kit - Lateral Assy 115mm	018222F
	Kit - Lateral Assy 126mm	018223F
9	Kit - Water Drain PVC	018224F
10	Kit - Transparent Cover AGP	018225F
11	Kit - Pump Basket AGP	018226F
12	Kit - Pump Impeller RPAGP75	018249F
13	Kit - Pump Impeller RPAGP100/102	018250F
	Kit - Pump Impeller RPAGP150/152	018251F
14	Kit - Mechanical Seal 1/2" with O Ring	018227F
15	Spider Gasket for 6-Way Valve	018767F
16		
17		

Table F. Replacement Parts



# 10. WARRANTY

## **LIMITED WARRANTY ABOVE GROUND SWIMMING POOL FILTER SYSTEMS Models: RPSFP16, RPSFP18, RPSFP181, RPSFP21, RPSFP211, RPCFP50, RPCFP75, RPCFP100, RPCFP150, RPCFP152, RPCFP202**

### **SCOPE OF WARRANTY**

Raypak, Inc. ("Raypak") warrants to the original owner that the above ground swimming pool cartridge filter system or sand filter system models listed above and sold with this Limited Warranty certificate (the "Filter System"), when installed in the United States of America with a pool, will be free from defects in materials and workmanship under normal use and service for the Applicable Warranty Period defined herein. In accordance with the terms of this this Limited Warranty, Raypak will, at its option, repair or furnish a replacement for the FILTER SYSTEM or any defective part of the FILTER SYSTEM that fails in normal use and service during the Applicable Warranty Period. The repair or replacement will be warranted for only the unexpired portion of the original Applicable Warranty Period, or the Extended Warranty Period, as the case may be.

### **EFFECTIVE DATE**

The Effective Date of this Limited Warranty is the date of original installation if properly documented. If you are not able to provide documentary proof of the date of original installation, the Effective Date will be thirty (30) days after date of purchase, not to exceed one (1) year after date of manufacture. All Applicable Warranty Periods specified in this Limited Warranty are measured from the Effective Date.

### **APPLICABLE WARRANTY PERIOD – UNREGISTERED**

If the FILTER SYSTEM is installed with a pool, the Applicable Warranty Period is ninety (90) days from the Effective Date, parts only, for the FILTER SYSTEM and component parts.

### **EXTENDED WARRANTY PERIOD – REGISTERED**

If, within 90 days of the Effective Date, the FILTER SYSTEM is installed in a pool at a single family residential dwelling and registered with Raypak ([www.raypak.com/warranty](http://www.raypak.com/warranty)), then the Applicable Warranty Period is one (1) year from the Effective Date for the FILTER SYSTEM and component parts.

### **LABOR AND SHIPPING COSTS**

This Limited Warranty does **NOT** cover any travel time or any labor costs. Furthermore, unless applicable state law provides otherwise, this Limited Warranty does **NOT** cover any shipping costs to and from Raypak's designated service provider or to or from the installation site. All of the foregoing costs and expenses are your responsibility, unless applicable state law provides otherwise.

### **WARRANTY EXCLUSIONS**

This Limited Warranty does **NOT** apply:

1. if the FILTER SYSTEM has been moved from its original place of installation, or if the original owner no longer owns the property where the original installation was made;
2. if the FILTER SYSTEM is not properly installed in a pool in accordance with applicable local codes and ordinances, good trade practices and the manufacturer's installation instructions;
3. if the rating plate(s) or serial number(s) are altered or removed;
4. if the FILTER SYSTEM is modified in any way, or if non-factory authorized accessories or other components are used in conjunction with the FILTER SYSTEM;
5. to damage, malfunctions or failures resulting from failure to properly install, operate or maintain the FILTER SYSTEM in accordance with the manufacturer's instructions;
6. to damage, malfunctions or failures resulting from abuse, act of nature, accident, fire, flood, freeze, lightning or the like;
7. to damage, malfunctions or failures resulting from connected system control devices;
8. to performance problems caused by improper sizing of the FILTER SYSTEM or electric service voltage, wiring or fusing;

9. to damage, malfunctions or failures resulting from any alteration, including the use of any attachment, including without limitation, any energy saving device not authorized by the manufacturer;
10. to damage, malfunctions or failures resulting from misuse or neglect, including but not limited to, freeze-ups.

#### **HOW TO MAKE A WARRANTY CLAIM**

You should immediately notify your dealer and provide proof of purchase model number serial number and date of installation. If the dealer is not available, please contact Raypak customer service at 805-278-5300. **Proper authorization MUST be obtained PRIOR to any repairs for the Limited Warranty to apply. This Limited Warranty is VOID if the product is repaired or altered in any way by ANY persons or agencies other than those authorized by Raypak.**

When requesting support please be ready to supply the model number, serial number, date of original installation and a description of the problem. Raypak reserves the right at all times to inspect, or require the return of, the defective FILTER SYSTEM or component part and to verify warranty coverage at its factory.

**Warranty service CANNOT be initiated until the status of the warranty coverage has been established.**

#### **EXCLUSIVE WARRANTY- LIMITATION OF LIABILITY**

**THE LIMITED WARRANTY IS THE ONLY WARRANTY PROVIDED BY RAYPAK IN CONNECTION WITH THE FILTER SYSTEM AND ITS COMPONENT PARTS. NO ONE IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES ON RAYPAK'S BEHALF. ANY IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIOD SPECIFIED IN THIS LIMITED WARRANTY. RAYPAK'S SOLE LIABILITY WITH RESPECT TO ANY DEFECT SHALL BE AS SET FORTH IN THIS LIMITED WARRANTY. IT IS AGREED THAT RAYPAK SHALL HAVE NO LIABILITY WHETHER UNDER THIS LIMITED WARRANTY OR IN CONTRACT, TORT OR NEGLIGENCE OR OTHERWISE FOR CLAIMS FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING NO LIABILITY FOR DAMAGE FROM WATER LEAKAGE), ALL OF WHICH ARE EXPRESSLY EXCLUDED, NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, OR FOR THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.**

We suggest you immediately record the model, serial number, date of original installation and receipt of purchase and retain this Limited Warranty Certificate in the event warranty service is needed.

**DO NOT RETURN THIS DOCUMENT TO RAYPAK. KEEP IT WITH YOUR POOL FILTER SYSTEM OR BUSINESS RECORDS.**

Register your product online at [www.raypak.com/warranty](http://www.raypak.com/warranty)

**RAYPAK, INC.,** 2151 Eastman Avenue, Oxnard, CA 93030 • (805) 278-5300 FAX (800) 872-9725





**ISO 9001**

**REGISTERED QUALITY MANAGEMENT SYSTEM**

**[www.raypak.com](http://www.raypak.com)**