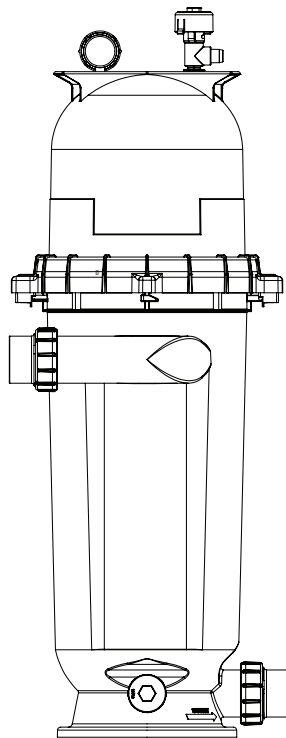




CLEAN AND CLEAR[®] RP CARTRIDGE FILTER



INSTALLATION AND USER'S GUIDE

IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

CUSTOMER SERVICE / TECHNICAL SUPPORT

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IMPORTANT WARNINGS AND SAFETY INSTRUCTIONS



IMPORTANT NOTICE:

This guide provides installation and operation instructions for the this filter. Consult Pentair Water Pool and Spa, Inc. with any questions regarding this equipment.

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

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



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

DANGER

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

WARNING

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

CAUTION


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

NOTE

Indicates special instructions not related to hazards.

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

Consumer Information and Safety

This filter is designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and cautions are identified by the “” symbol. Be sure to read and comply with all of the warnings and cautions.

WARNING

Before installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage. Call (800) 831-7133 for additional free copies of these instructions or replacement safety labels.

WARNING

Do not operate the filter until you have read and understand clearly all the operating instructions and warning messages for all equipment that is a part of the pool circulating system. The following instructions are intended as a guide for initially operating the filter in a general pool installation. Failure to follow all operating instructions and warning messages can result in property damage or severe personal injury or death.

WARNING



Due to the potential risk that can be involved it is recommended that the pressure test be kept to the minimum time required by the local code. Do not allow people to work around the system when the circulation system is under pressure test. Post appropriate warning signs and establish a barrier around the pressurized equipment. If the equipment is located in an equipment room, lock the door and post a warning sign.

Never attempt to adjust any closures or lids or attempt to remove or tighten bolts when the system is pressurized. These actions can cause the filter to separate and could cause severe personal injury or death if they were to strike a person.

WARNING

This filter must be installed by a qualified pool serviceman in accordance with all applicable local codes and ordinances. Improper installation could result in death or serious injury to pool users, installers, or others and may also cause damage to property.

WARNING



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

WARNING

DO NOT permit children to use this product.

IMPORTANT WARNINGS AND SAFETY INSTRUCTIONS

WARNING

THIS SYSTEM OPERATES UNDER HIGH PRESSURE

When any part of the circulating system, (e.g., closure, pump, filter, valve(s), etc.), is serviced, air can enter the system and become pressurized. Pressurized air can cause the top closure to separate which can result in severe injury, death, or property damage. To avoid this potential hazard, follow these instructions:



1. Let air and pressure out of system before and after servicing.
 - a. **Shut off pump and RELIEVE PRESSURE by opening the manual air/pressure relief valve before servicing.**
 - b. Follow *Startup Instructions, page 3* exactly after completing service. **The air/pressure relief valve must remain open until water comes out**, allowing all air out of the system.
2. Install lock ring properly.
 - a. Follow *Lock Ring Installation Instructions, page 3*.
3. Maintain circulation system properly to help prevent air entering the system.
 - a. Replace worn or damaged parts immediately, (e.g., closure, pressure gauge, valve(s), O-rings, etc.).
 - b. Maintain proper water level in the pool or spa.
4. Verify that the return line to the pool is unobstructed. Ensure return valves are open and any winterizing plugs are removed.

WARNING

AVOID DAMAGING SYSTEM

Never Exceed Maximum Pressure of Components. The maximum working pressure of this filter is 50 psi. Never subject this filter to higher pressure, even when conducting hydrostatic pressure tests. Pressures above 50 psi can damage your filter.

Be sure the maximum pressure of the filter system does not exceed the maximum pressure of any components within the system (typically stated on each component), including during hydrostatic or external leak tests. Exceeding the maximum pressure of a component can result in that component failing. If you do not know the pool or spa system operating pressure, install an ASME approved automatic Pressure Relief or Pressure Regulator in the circulation system set to the lowest working pressure of any of the components in the system.

WARNING

Certain codes may require pressure testing the system. Performing pressure tests increases the risk of component failure. Due to the potential risk that can be involved, keep the pressure test to the minimum time required by the local code and take precautions. If pressure testing is necessary, follow these precautions:



1. Keep people away.
 - a. Do not allow people to work around the system when the circulation system is under pressure test. Post appropriate warning signs and establish a barrier around the pressurized equipment. If the equipment is located in an equipment room, lock the door and post a warning sign.
2. Never exceed maximum operating pressure.
 - a. When performing hydrostatic pressure tests or when testing for external leaks of the completed filtration and plumbing system, ensure that the Maximum Pressure that the filtration system will be subjected to does not exceed the maximum working pressure of any of the components contained within the system.

GENERAL INFORMATION

⚠ WARNING

THIS SYSTEM OPERATES UNDER HIGH PRESSURE.

When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow the instructions below.



General Operation Information

Read and follow all instructions and warnings before installing or servicing your filter. Proper installation and operation can prevent unnecessary repairs and maintenance.

⚠ WARNING

Your filter is a piece of machinery, do not tamper with it, attempt to disassemble it or otherwise adjust it unless you fully understand it's operation. Serious injury or death can occur if the equipment is improperly handled. Consult a pool service professional for maintenance and service assistance.



1. The Clean and Clear® RP Cartridge Filter operates under pressure. When the lock ring is installed properly and operated without air in the water system, this filter will operate in a safe manner.
2. The maximum working pressure of this filter is 50 psi. Never subject this filter to pressure in excess of this amount, even when conducting hydrostatic pressure tests.
3. Be sure the maximum pressure of the filter system does not exceed the maximum pressure of any components within the system during hydrostatic or external leak tests. Consult the maximum pressure stated on each component of the system.
4. The pressure gauge is the primary indicator of how the filter is operating. Maintain your pressure gauge in good working order.
5. **Clean your filter when pressure reads between 8-10 psi higher than the "Original Starting Pressure", or when significant reduction in flow is noticed.** The pressure reading increases as it filters dirt from your pool. This build up of pressure will vary due to different bathing loads, temperature, environmental conditions, etc.

Note: When using a variable speed pump the "Original Starting Pressure" will be dependent on the pump speed (RPM) when recording the original operating pressure. Record the "Original Pump RPM" in **TABLE 1**.

Note: When the cartridge element filter is used on new pools and after cleaning the elements, introduce into the system 0.5 pounds of diatomaceous earth per every 100 square feet of filter area, (a one-pound coffee can equals 0.5 pounds of diatomaceous earth). Mix the diatomite with water and pour it into the skimmer after the pump is primed and the system is operating. This will enhance the filtration of your water.

Pressure Tests

When performing hydrostatic pressure tests or when testing for external leaks of the completed filtration and plumbing system, ensure that the Maximum Pressure that the filtration system will be subjected to **DOES NOT EXCEED THE MAXIMUM WORKING PRESSURE OF ANY OF THE COMPONENTS CONTAINED WITHIN THE SYSTEM.** In most cases, the maximum pressure will be stated on each component of the system.

If you do not know the pool or spa system operating pressure, install an ASME approved automatic Pressure Relief or Pressure Regulator in the circulation system set to the lowest working pressure of any of the components in the system.

TABLE 1

ORIGINAL STARTING PRESSURE IS: _____ psi. (pounds per square inch)
SERVICE THE CARTRIDGES AT: _____ psi.
ORIGINAL PUMP RPM: _____ rpm. (for Variable Speed Pumps Only)

INSTALLATION

⚠ WARNING

This filter must be installed by a qualified pool technician in accordance with all applicable local codes and ordinances. Improper installation could result in death or serious injury to pool users, installers, service persons, or others and may also cause damage to property.

⚠ WARNING



For Installation of Electrical Controls at Equipment Pad (ON/OFF Switches, Timers, Control Systems and Automation)

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

Filter Location

1. The Clean and Clear® RP Cartridge Filter should be mounted on a level concrete slab. **Position the filter so that instructions, warnings and the pressure gauge are visible to the operator and readable.** It also should be positioned so that the piping connections, control valve and waste drain plug are convenient and accessible for servicing and winterizing.
2. Be certain to install electrical controls (e.g., on/off switches, timers, control systems, etc.) so that the user is allowed enough space to stand clear of the filter and pump during startup, shutdown or servicing.
3. Allow sufficient clearance around the filter to permit visual verification that the lock ring is properly installed around the tank flanges, see **FIGURE 1**.
4. Allow sufficient space above the filter to remove the filter lid for cleaning and servicing. This distance will vary with the model of filter you are using. See **TABLE 2** for the required vertical clearance.
5. Position the filter to safely direct water drainage away from electrical equipment or anything that might be damaged.
6. Position the High Flow™ Manual Air Relief Valve to safely direct purged air or water.

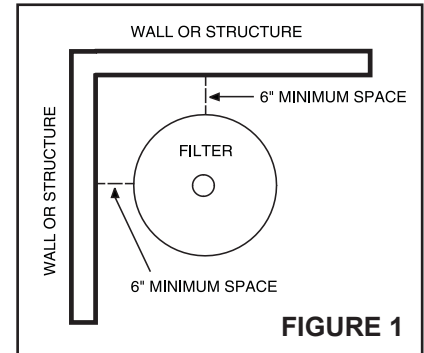


FIGURE 1

TABLE 2

<u>Model</u>	<u>Size</u>	<u>Vertical Clearance Req.</u>
160354	100 sq. ft.	61 in.
160355	150 sq. ft.	76 in.
160353	200 sq. ft.	76 in.

⚠ WARNING



RISK OF ELECTRICAL SHOCK OR ELECTROCUTION. Water discharged from an improperly positioned filter or valve can create an electrical hazard that can cause severe personal injury as well as damage property.

Filter Plumbing

Make all plumbing connections in accordance with local plumbing and building codes. Do not use pipe joint compound, glue or solvent on the bulkhead connections. The provided filter plumbing connections include an O-ring seal.

⚠ CAUTION

Use PTFE or silicone based lubricants when lubricating the O-rings on the union and bulkhead couplings. Use of petroleum based products will damage the equipment.

OPERATION

Lock Ring Installation Instructions

⚠ WARNING



THIS SYSTEM OPERATES UNDER HIGH PRESSURE.

When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow the instructions below.

These instructions **MUST BE FOLLOWED EXACTLY** to prevent the lid from separating during system restart or later operation.

1. Perform the following steps before working on any part of the circulating system (e.g., lock ring, pump, filter, valves, etc.).
 - a. Turn the pump off and shut off any automatic controls to ensure that the system is not inadvertently started during servicing.
 - b. Open the High Flow™ manual air relief valve.
 - c. Wait until all pressure is relieved. **Never attempt to assemble, disassemble or adjust the filter lock ring while there is any pressure in the filter.**
2. Be certain the O-ring is in position in the lower tank half. Place the filter lid over the lower tank half, making sure it is fully and firmly seated on the tank half, see **FIGURE 2**.
3. Place lock ring over the tank lid, and centering the lock ring on the threads of the tank body. Turn the lock ring clockwise until the safety latches click and the lock ring hits the stops on the body. **DO NOT ATTEMPT TO OVER-TIGHTEN THE LOCK RING AFTER LOCK RING HAS HIT THE STOPS ON THE BODY.**
4. Follow the *Startup Instructions* below.

Startup Instructions

⚠ WARNING



THIS SYSTEM OPERATES UNDER HIGH PRESSURE.

When any part of the circulating system (e.g., Lock Ring, Pump, Filter, Valves, etc.) is serviced, air can enter the system and become pressurized. Pressurized air can cause the lid to separate which can result in serious injury, death, or property damage. To avoid this potential hazard, follow the instructions below.

1. **Open the High Flow™ manual air relief valve until it snaps into the full open position (this only requires a quarter turn counterclockwise).** Opening this valve rapidly releases air trapped in the filter.
2. Stand clear of the filter tank, then start the pump.
3. Close the manual air relief valve after a steady stream of water appears.
4. The system is not working properly if either of the following conditions occur.
 - a. A solid stream of water does not appear within 30 seconds, after the pump's inlet basket fills with water.
 - b. The pressure gauge indicates pressure before water outflow appears.

If either condition exists, **shut off the pump immediately**, open valves in the water return line to relieve pressure, and clean the air relief valve, see *Cleaning the Manual Air Relief Valve, page 4*. If the problem persists, call (800) 831-7133 for assistance.

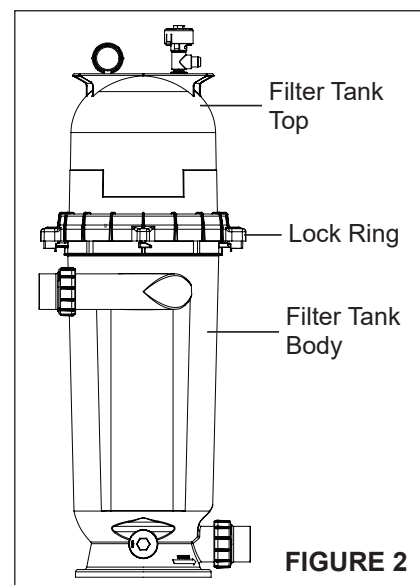


FIGURE 2

MAINTENANCE

Maintaining the Pressure Gauge

The pressure gauge is the primary indicator of how the system is operating, so correct functioning is critical. Replace the pressure gauge (Pentair P/N 190058) if it does not meet the requirements below:

1. Pressure gauge should go to zero (0) when the system is turned off and pressure is relieved.
2. Pressure gauge should indicate pressure when the system is operating.
3. The pressure gauge should be readable and not damaged in anyway

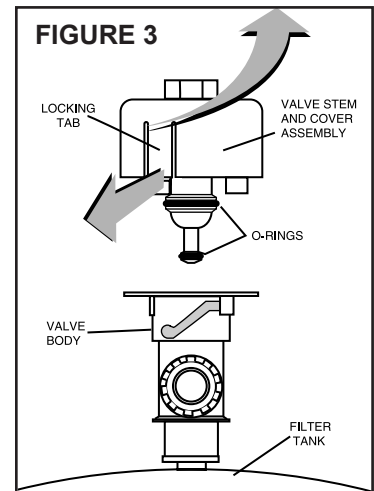
Cleaning the Manual Air Relief Valve

RECOMMENDED EQUIPMENT:

- 5/16" Drill Bit (to check air passage)
- Silicone-based Lubricant (if needed)

PROCEDURE:

1. Shut off pump and relieve pressure.
 - a. Turn the pump OFF and shut OFF any automatic controls (e.g., timers) and disconnect power to ensure that the system is not inadvertently started during maintenance.
 - b. Open the manual air relief valve by turning the valve cover assembly a quarter turn counter-clockwise until it snaps into the full open position.
 - c. Stand clear of the filter and wait until all pressure is relieved. **Pressure gauge must read zero (0 psi).**
2. With the relief valve attached to the Clean and Clear® RP Cartridge Filter tank, pull out the locking tabs and unlock the valve stem and cover assembly from the valve body with a counter-clockwise turn, see **FIGURE 3**.
3. Pull the valve stem and cover assembly straight up and away from the valve body.
4. Clean and check the valve stem and body:
 - a. Clean off any debris.
 - b. Verify that the filter tank's air passage is open by inserting a 5/16" drill bit through the valve body.
 - c. Verify that the valve stem O-rings are in good condition, properly positioned, and lubricated with a silicone-base lubricant.



If needed, use only a PTFE or silicone-base lubricant on the O-rings. Use of petroleum based products on O-rings will damage the equipment.

5. Reinstall the valve stem and cover assembly with a downward and clockwise motion until it snaps into position.

Cleaning the Filter



WARNING The following information should be read carefully since it outlines the proper manner of care and operation for your filter system. As a result of following these instructions and taking the necessary preventative care, you can expect maximum efficiency and life from your filter system.

1. Turn the pump off, shut off any automatic controls to ensure that system is not inadvertently started during servicing.
2. Open the filter High Flow™ manual air relief valve (and the waste drain valve, or cap, if your system has one).
3. Remove hair and lint strainer pot lid and clean basket. Replace basket and secure lid.
4. Disconnect air relief drain hose if installed.
5. Remove lock ring by depressing safety latches on both sides of ring and rotate counterclockwise, then remove tank lid.
6. Remove the element assembly by placing hands in lifting handles and pulling straight up on the element assembly.
7. Remove the cartridge element from the center support tube.
8. Using a garden hose with a nozzle, direct water spray at the cartridge element to dislodge and wash away accumulated foreign matter. Water may be sprayed at the outside as well as the inside of the cartridge element for thorough cleaning.
9. For cartridges used in pools or spas where high levels of perspiration, suntan lotions and other oils are present:
 - a. Soak the cartridge for at least one hour (overnight is most effective) in one of the following:
 - A commercial filter cleaner



WARNING Heed all manufacturers' instructions and warnings when using polyhexamethylene biguanide sanitizers or other cartridge filter cleaner solutions.

- One cup trisodium phosphate (TSP) to five gallons of water
- One cup dishwasher detergent to five gallons of water

- b. Rinse the cartridge to remove oils and cleaning solution.



CAUTION Failure to remove all oils and cleaning solutions before acid soaking will result in permanent restriction of water flow through the filter and will cause premature cartridge failure.

10. Direct the water spray to wash out the inside of the tank body and bottom manifold. Water and debris will drain out through the open drain plug.
11. Check gasket around outer lip of bottom plate. Gasket must be firmly and evenly set around the entirety of the outer lip.
12. Turn the cartridge element over several times during the washing operation to clean the media thoroughly.
13. Clean and remove debris from inside the filter tank and from the O-ring and O-ring groove on the tank body.
14. Replace clean cartridge element on support tube and install assembly into the filter tank body, aligning the arrow on the support tube with the inlet port of the filter, making sure it is fully seated. Make sure the internal air relief screen is attached to the top of the element support tube.
15. Replace the tank lid onto the tank body making sure it is fully and firmly seated on the tank body.
16. Place lock ring over tank lid, and centering the lock ring on the threads of the tank body, turn the lock ring clockwise until the safety latches click and the lock ring hits the stops on the body. **DO NOT ATTEMPT TO OVER-TIGHTEN THE LOCK RING AFTER LOCK RING HAS HIT THE STOPS ON THE BODY.**

Note: Any time the filter tank is opened, and/or element assembly is removed, be sure to generously coat the O-ring with silicone lubricant before reassembling the unit. **DO NOT USE PETROLEUM BASED LUBRICANTS BECAUSE THEY HAVE A DETERIORATING EFFECT ON RUBBER.**
17. Replace drain cap and reinstall manual air relief valve drain hose if used.

Replacing the Cartridge Element

Cartridge element life will vary with pool conditions such as bather load, wind, dust, etc. You can expect an average media life of three years under normal conditions.

To replace cartridge element follow steps in *Cleaning the Filter* above.

TROUBLESHOOTING

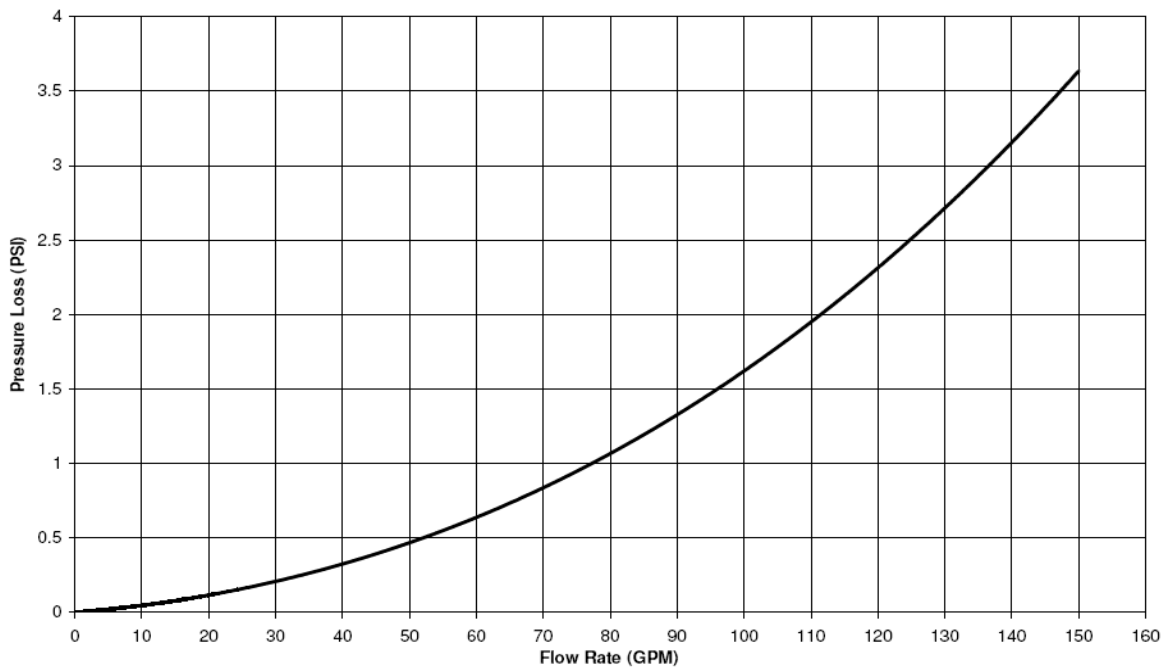
1. Air entering your filter is dangerous and can cause the lid to separate. Correct any conditions in your filtration system that allow air to enter the system.

Some common ways to identify air entering the system:

- a. Low water level in pool or spa - skimmer is starving for water with pump running. Add water to pool or spa.
 - b. Air bubbles or low water level in pump hair and lint pot are caused by; low water level, clogged skimmer basket, split suction cleaner hose, leak in pump hair and lint pot lid, or leak in pump suction line.
 - c. Air bubbles coming out of water return lines into pool or spa with pump running.
 - d. Air is discharged from the air relief valve on top of the filter when the valve is opened with the pump running.
2. Until the water initially put into the pool has been completely filtered, short filter cycles in between cleanings are normal. In most cases pool owners are dismayed by the undesirable color and appearance of water in a newly filled pool. Plaster dust can be responsible for short filter cycles, requiring frequent cleaning.
 3. If pressure drops on gauge, check skimmer basket and pump basket first for debris. If the baskets are clean, shut off power to pump and turn off any automatic controls. Then turn motor shaft with your fingers. If it turns freely then the pump must be disassembled and the impeller checked to see if it is clogged. If it is not frozen or clogged then there is an obstruction in the line between the pool and the pump.
 4. The pressure gauge is an important part of the filter system. It is your primary indicator of how the system is operating. Maintain your pressure gauge in good working order. Check the operation of your pressure gauge in the following manner:
 - a. The pressure gauge should go to zero (0) when the system is turned off and pressure is relieved.
 - b. The pressure gauge should indicate pressure when the system is operating.
 - c. The pressure gauge should be readable and not damaged in any way.
 - d. Replace the pressure gauge if it does not meet the requirements above.

TECHNICAL DATA

Pressure Loss Chart



Flow Rates

Model	P/N	Filter Area	Residential Maximum Cartridge Flow Rates				Commercial Maximum Cartridge Flow Rates			
			GPM	GPH	6 hour	8 hour	GPM	GPH	6 hour	8 hour
CNCRP 100	160354	100	100	6,000	36,000	48,000	38	2,280	13,680	18,240
CNCRP 150	160355	150	150	9,000	54,000	72,000	56	3,360	20,160	26,880
CNCRP 200	160353	200	150	9,000	54,000	72,000	75	4,500	27,000	36,000

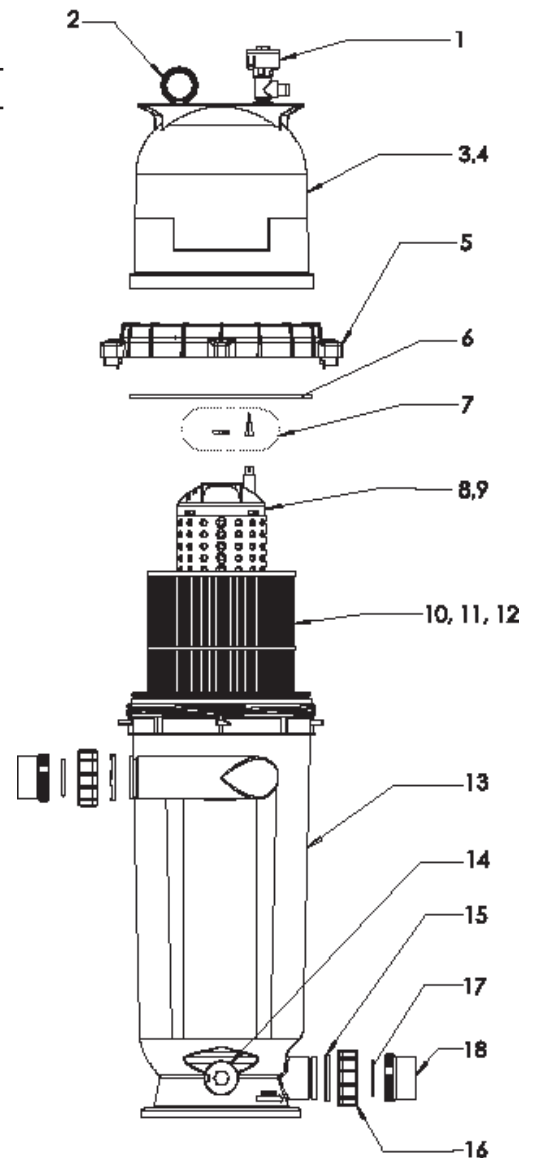
(1) Recommended flow rate for residential is 0.5 GPM per sq. ft.

(2) Commercial flow rate is a maximum of 0.375 GPM per sq. ft. of filter area.

NOTE: Actual system flow will depend on plumbing size and other system components.

REPLACEMENT PARTS

Item	P/N	Description
1	98209800	High Flow Manual Air Relief
2	190058	Pressure Gauge
3	178548	Lid, CNCRP 100
4	178546	Lid, CNCRP 150/200
5	59052900	Lock Ring Assembly
6	87300400	Body O-ring
7	59016200	Air Bleed Sock Kit
8	59053700	Center Core, CNCRP 100
9	59053800	Center Core, CNCRP 150/200
10	R173215	Cartridge Element, CNCRP 100
11	R173216	Cartridge Element, CNCRP 150
12	R173217	Cartridge Element, CNCRP 200
13	178731	Tank Bottom
14	154712z	Drain Cap Assembly (before 10/17)
14	190030z	Drain Cap Assembly (after 10/17)
15	178732	Union Nut "C" Clip
16	U11-200PS	Union Nut
17	178746	Union, Diamond Seal
18	178733	Union, Threaded Half





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