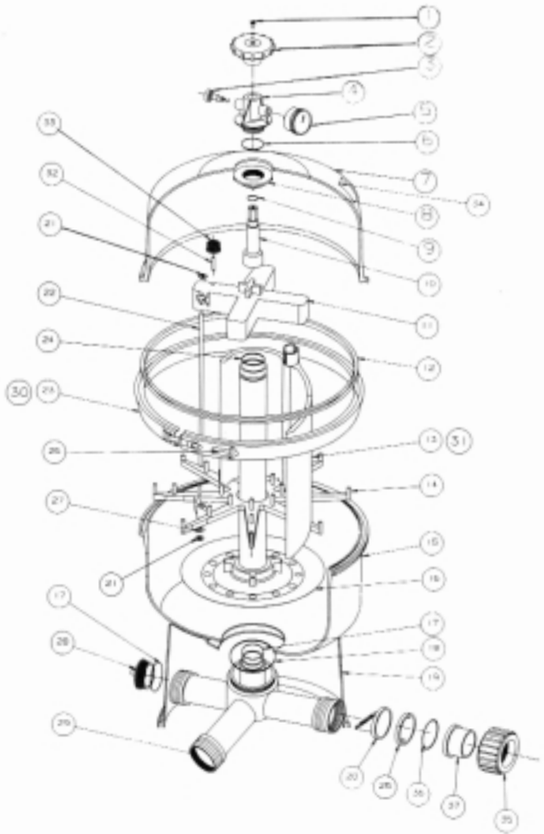
STAR

MODEL ST80, ST50, ST35

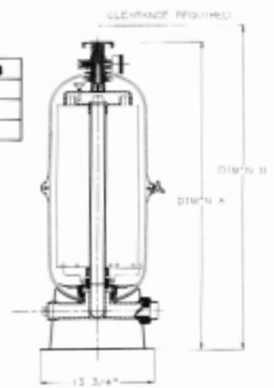


I. REPLACEMENT PARTS

Item	Part No.	Description	Qty.
37	35-2207	ADAPTOR-QUICK CONNECT (See Note 5)	1
36	35-4571	O-RING (See Note 5)	1
35	35-2206	NUT-QUICK CONNECT (See Note 5)	1
34	15-4603	LABEL-WARNING	1
33	19-1329	STRAINER-AIR RELIEF	1
32	19-1606	TUBING 1/4"	1
31	19-1519	GRID ASSEMBLY-COMPLETE ST-80 (See Note 1)	1
31	19-1486	GRID ASSEMBLY-COMPLETE ST-50 (See Note 1)	1
31	19-1953	GRID ASSEMBLY-COMPLETE ST-35 (See Note 1)	1
30	17-4880	BAND ASSEMBLY-COMPLETE (See Note 2)	1
29	19-1469	PIPING-BOTTOM WITH CHECK VALVE	1
28	75-0020	PLUG-1 1/2"	1
27	19-1330	WASHER-LOCK 1/4" SS	2
26	17-4882	KNOB-BAND ASSEMBLY	1
25	19-1505	LOCK NUT-CHECK VALVE	1
24	19-1517	O-RING - 1 5/8" x 1 13/16" x 3/32"	1
23	17-4879	CLAMP BAND	1
22	19-1513	ROD - 1/4" x 28" ST-80	2
22	19-1430	ROD - 1/4" x 21 1/2" SS ST-50	2
22	19-1948	ROD - 1/4" x 15" SS ST-35	2
21	27-2408	NUT-HEX 1/4-20 SERRATED SS (See Note 4)	4
20	19-1437	CHECK VALVE ASSEMBLY	1
19	19-1423	FOOT-TANK	1
18	19-1424	O-RING 3 1/2" x 3 7/8" x 3/16"	1
17	19-1474	O-RING 1 3/4" x 2" x 1/8"	2
16	19-1512	PIPE-CENTER W/DIFFUSER ST-80	1
16	19-1483	PIPE-CENTER W/DIFFUSER ST-50	1
16	19-1942	PIPE-CENTER W/DIFFUSER ST-35	1
15	19-1511	BOTTOM-TANK ST-80	1
15	19-1422	BOTTOM-TANK ST-35, ST-50	1
14	19-1467	RETAINER-GRID BOTTOM	1
13	19-1510	GRID - ST-80	4
13	19-1322	GRID - ST-50	4
13	19-1321	GRID - ST-35	4
12	17-4704	O-RING - TANK	1
11	19-1950	MANIFOLD ASSEMBLY	1
10	19-1480	SHAFT ENGAGEMENT ST-50, ST-80	1
10	19-1955	SHAFT ENGAGEMENT ST-35	1
9	19-1479	O-RING 7/8" x 1 1/8" x 1/8"	1
8	19-1478	NUT - 1 7/8" - 8" BUTTRESS	1
7	19-1516	TOP-TANK ST-80	1
7	19-1477	TOP-TANK ST-50	1
7	19-1954	TOP-TANK ST-35	1
6	15-5564	O-RING 47 MM x 4 MM	1
5	15-5050	GAUGE-BACK MOUNT PRESSURE	1
4	19-1475	ADAPTOR-TANK TOP	1
3	27-2515	SCREW-AIR BLEEDER W/O-RING	1
2	19-1472	KNOB-ENGAGEMENT SHAFT	1
1	55-2472	SCREW-FLATHEAD #12x1"	1

DIMENSIONAL TABLE

MODEL	DIM'N A	DIM'N B
STAR ST-35	29 3/4"	38"
STAR ST-50	37 3/8"	50"
STAR ST-80	44"	63"



NOTE 1: ITEM 31, GRID ASSEMBLY-COMPLETE CONSISTS OF ITEMS 11, 13, 14, 21, 22, 27, 32, 33.

NOTE 2: ITEM 30, P/N 17-4880 BAND ASSEMBLY-COMPLETE CONSISTS OF ITEMS 23 AND 26.

NOTE 3: APPLY SILICONE SEALANT TO ACME THREADS ON ITEM 16, P/N 19-1483.

NOTE 4: SOME FILTERS REQUIRE ONLY TWO NUTS (ITEM 21), DUE TO DESIGN OF TIE ROD (ITEM 22).

NOTE 5: REFERENCE PARTS FOR REPLACEMENT PARTS PUBLICATIONS.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

STAR™

REGENERATIVE DIATOMACEOUS EARTH FILTER

INSTALLATION, OPERATION & SERVICE MANUAL

WARNING

THIS MANUAL CONTAINS CRITICAL SAFETY INFORMATION WHICH MUST BE FURNISHED TO THE END USER. FAILURE TO READ AND FOLLOW INSTRUCTIONS COULD RESULT IN SERIOUS PERSONAL INJURY AND / OR MAJOR PROPERTY DAMAGE.

FILTER IS DESIGNED AND INTENDED FOR USE TO FILTER WATER IN SWIMMING POOLS.

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Pentair Pool Products™
Because reliability matters most

8-Inspect grid cloth for tears, calcification, plugged areas, etc. If necessary soak element in filter cleanser to remove buildup of oils, etc. One of the following cleaners is recommended:

FILTER-CLEANSE-Great Lakes Biochemical
FILTER-FREE-Hydrotech Chemical Corp.
KLEEN-IT-Bio Lab, Inc.

Mix a solution following the manufacturer's instructions on the label. Place the entire grid assembly in a plastic container and add the solution so the entire grid assembly is submerged. Allow to stand overnight (12 hours). The following day, wash with a hose and remove all of the solution from the grids so it does not return to the pool.

9-Thoroughly clean air relief filter screen.

10-With filter drain open, hose down the internal portion of filter and thoroughly clean sealing area of tank halves.

11-Replace the grid assembly by setting the manifold opening directly over the center connector pipe. The grid assembly should rest on the center pipe and turn freely to stops.

12-Thoroughly clean drain plug seal and sealing area and replace and tighten plug.

FILTER REASSEMBLY PROCEDURE

1-Be certain the grid assembly is inserted into the bottom fitting. Clean the two tank flanges and the tank O-Ring.

2-Be sure O-Ring is in proper position.

3-After installing the O-Ring, replace the top cover and guide it carefully so the handle shaft assembly engages the grid assembly. DO NOT FORCE THE COVER TO CLOSE.

4-Locate the filter clamp over both flanges, tank top and tank bottom.

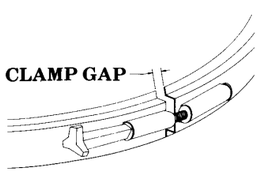
5-While tightening hand knob you must tap clamp all around the diameter with a mallet or similar tool to insure uniform loading.

WARNING

Air entrapped in the filter and the tank clamp not closed properly can cause the tank top to blow off and could cause severe bodily injury and/or property damage.

6-Be certain the hand knob is firmly tightened as much as possible using full hand power to tighten.

The gap between the clamp ends should be between 3/8" and 7/8". Do not use excessive force such as wrenches or pliers which could overstress the hardware.



7-If unit is returning to service, see "Initial Startup".

8-If cleaning is part of seasonal shutdown, see "Winterizing".

G. WINTERIZING THE FILTER

1-In areas that have freezing winter temperatures, protect the pool and spa equipment by draining both the pump and the filter.

2-Shut off the pump.

3-Open the air vent or bleeder on top of the filter tank and remove the drain plug.

4-Open all valves and allow the filter to completely drain. It is recommended that the filter grid assembly be thoroughly cleaned at the end of the swimming pool season, dried out and stored in a clean dry area out of direct sunlight.

5-Drain all appropriate system piping.

6-We recommend covering the equipment with a tarpaulin or plastic sheet to inhibit deterioration from weather exposure. Do not wrap pump motor with plastic.

This filter operates under pressure and if assembled improperly or operated with air in the water circulation system it can separate and result in an accident causing serious bodily injury and/or property damage. A warning label has been affixed to the top of the filter and should not be removed. Keep safety labels in good condition and replace if missing or illegible (For free labels call 1-800-833-3692).

A. HOW YOUR FILTER WORKS

Your D.E. Filter is designed to operate for years with a minimum of maintenance. The filter utilizes corrosion resistant materials and when installed, operated and maintained in accordance to these instructions, it will provide years of trouble free operation.

Your Star is a diatomaceous earth (DE) type regenerative filter. The unit requires D.E. in order to operate. The filter grid cloth is covered with a thick coating of D.E.

Dirt is collected in the D.E. as the water flows into the bottom piping inlet and is distributed evenly around the filter. Dirt is collected by the filter as the flow passes from the outside of the grid to the inside of the grid. The flow then moves upward to the top manifold where it is then channeled downward through the center pipe into the bottom piping and it returns clear water to the pool.

The pressure inside the filter will rise and the flow to the pool will be reduced as the dirt is collected in the filter. Eventually, the filter will become so plugged with dirt that it will be necessary to perform a regeneration procedure. It is important to know when to regenerate the filter.

The regeneration process is a mechanical means of dislodging the D.E. and dirt to allow better, more efficient use of the D.E. The knob on the top of the filter is used to mechanically "swish" the internal grid assembly and allow it to "bump" built-in stops. It is this "swish and bump" motion that dislodges the D.E. and dirt.

Eventually the D.E. becomes completely loaded with dirt so that the regeneration process becomes ineffective, at this point cleaning is necessary. Regeneration and cleaning are discussed further under subsequent sections of this booklet.

Please note that a filter removes suspended matter and does not sanitize the pool. The pool water must be sanitized and chemically balanced for sparkling clear water.

Your filtration system should be designed to meet your local health codes. As a minimum you must be sure that your system will turnover the total volume of water in your pool at least two to four times in a twenty-four hour period.

Refer to Table A for Filter Operational Data.

WARNING

Failure to operate your filter system or inadequate filtration can cause pool water clarity obstructing visibility in your pool and can allow diving into or on top of obscured objects which can cause serious personal injury or drowning.

Clear water is the result of proper filtration as well as proper water chemistry. Pool chemistry is a specialized area and you should consult your local pool service specialist for specific details. In general proper sanitation requires a free chlorine level of 1 to 2 PPM and PH range of 7.2 to 7.6

B. INSTALLATION

1-Check carton for any evidence of damage due to rough handling in shipment. If carton or any filter components are damaged, notify freight carrier immediately.

2-Carefully remove the accessory package and the filter tank from the carton.

3-Mount the filter on a permanent slab, preferably concrete poured in a form or on a platform constructed of concrete block or brick. **DO NOT** use sand to level the filter or for pump mounting, as it will wash away.

4-Provide space and lighting for routine maintenance. Do not mount electrical controls over the filter. One needs to be able to stand clear of the filter when starting the pump. Minimum space requirements may be found on the large nameplate on the filter.

5-All filter connections are 1 1/2" NPT. Note each connection, also allows the use of an optional Quick Connect fitting if desired. This allows for quick and easy removal of the filter. Be certain the piping is as follows: A) From the pool to the inlet of the pump; B) From the outlet of the pump to the inlet of the filter; C) From the outlet of the filter to the pool.

6-Assemble piping and pipe fittings to pump and filter. All piping must conform to local and state plumbing and sanitary codes.

7-Use sealant compounds on all male connections of pipe and fittings. Quick Connects do not require sealant! Use only pipe compounds suited for plastic pipe. Support pipe to prevent strains on filter, pump or valve.

FILTER OPERATIONAL DATA TABLE A

FILTER MODEL NUMBER	FLOW RATE (GPM)	TURNOVER CAPACITY (Gallons) 4 TURNS PER DAY	3 TURNS PER DAY	2.4 TURNS PER DAY
ST-35	35	12,600	16,800	21,000
ST-50	50	18,000	24,000	30,000
ST-80	80	28,800	38,400	48,000

8-Long piping runs and elbows restrict flow. For best efficiency, use the fewest possible fittings, large diameter pipe (at least 1 1/2") and locate equipment as close to pool as possible.

9-If a pool heater is installed a check valve is recommended between the filter and heater to prevent hot water "back up" which will damage the filter.

10-The maximum operating pressure of this unit is 50 pounds per square inch. Never operate this filter above this pressure or attach a pump to this filter that has more than 50 psi shut off pressure.

11-Never install a chlorinator upstream of the filter. Always install downstream and with a check valve in between the chlorinator and filter.

12-A positive shut off valve is not recommended at the outlet of the filtering system. If the system is ever run with such a valve closed, the internal air relief system becomes inoperative and an explosive situation could exist. Additionally running the system with no flow will seriously damage the equipment.

13-Never store pool chemicals within 10 feet of your pool filter. Pool chemicals should always be stored in a cool, dry, well ventilated area.

WARNING

Chemical fumes and/or spills can cause severe attack of filter structural components. Structurally weakened filter components can cause filter or attachments to blow off and could cause severe bodily injury or property damage.

C. INITIAL START-UP

1-On a new pool, clean the pool before filling the pool with water. Excessive dirt and large particles can cause damage to pump and filter.

2-Check the pump strainer pot to be certain it is full of water. Be certain all valves, "if any are present" are open on both the suction and the discharge lines.

3-Check the tank clamp hand knob for tightness.

WARNING

Air entrapped in the filter and the tank clamp not closed properly can cause the tank top to blow off and could cause severe bodily injury and/or property damage.

4-Open the manual air bleeder on the top of the tank. Stand clear of filter and start the pump allowing it to prime.

5-Close the air bleeder when a steady stream water emerges.

6-Remove the skimmer lid, put the recommended amount of diatomaceous earth (D.E.) into the skimmer. The D.E. will be drawn into the filter and deposited evenly upon the grid elements. Now the filter is providing the pool with bright, clean water.

NOTE: DO NOT OPERATE FILTER WITHOUT D.E. CHARGE FOR MORE THAN TWO MINUTES. DO NOT USE MORE THAN THE RECOMMENDED AMOUNT OF D.E. IN YOUR FILTER.

REGENERATIVE D.E. RECOMMENDATION

The amount of D.E. should be between 3 and 4 pounds for each 10 square feet of filter area or:

MODEL	POUNDS OF D.E.
ST 35	2 - 3
ST 50	3 - 4
ST 80	4 - 5 1/2

NOTICE: 1/2 pound of DE will fill a 13 oz. coffee can.

D. FILTER CARE

The filter is a very important part of the pool equipment and installation. Proper care and maintenance will add many years of service and enjoyment to the pool. Follow these suggestions for long trouble-free operation.

1-To clean the exterior of the filter of dust or dirt, use a mild detergent and water and then hose off. Do not use solvents.

WARNING

Always visually inspect filter components during normal servicing to insure structural safety. Replace any item which is corroded, bent or otherwise visually defective. Defective filter components can allow the filter top to blow off and could cause severe bodily injury or property damage.

2-The filter clamp used on your filter was manufactured with high quality corrosion resistant materials. The manufacturing process could allow sharp edges to be present on the parts. When working around the clamp, use caution to prevent potential injury to fingers or hands from contact with sharp edges.

3-Your filter is a pressure vessel and should never be serviced while under pressure. Always shut off pump to relieve tank pressure and open air bleeder before attempting to service your filter.

4-When restarting your filter, always open the manual air bleeder and stand clear of the filter.

E. CLEANING FREQUENCY

(REGENERATION OR MANUAL CLEANING)

1-The filter on a new pool should be cleaned after approximately 48 hours of operation to clean out plaster dust and/or construction debris.

2-There are different ways to identify when the filter needs regeneration.

A) The most accurate indicator on pool systems with a flow meter is to regenerate the filter when the flow decreases 30% from the original (clean filter) flow. For example, if the original flow was 50 gpm, the filter should be regenerated when the flow is reduced by about 15 GPM (or 30%) to 35 GPM.

B) A more subjective and less accurate indicator is to observe the amount of water flowing from the flow directions located in the wall of the pool. The filter should be regenerated once it is detected that the flow has been reduced by about 1/3.

C) The most commonly used but least accurate indicator is to regenerate the filter when the filter gauge reading increases 10 psi over the initial (clean filter) reading.

3-Factors like weather conditions, heavy rains, dust or pollen, and water temperatures all affect the frequency of regeneration. As you use your pool you will become aware of these influences.

4-Regeneration "Swish and Bump" - When the flow has been reduced or the pressure gauge has increased as mentioned above, the regeneration is necessary. Stop the pump and move the knob clockwise to bump one stop and then counter clockwise to the other stop. Perform this operation 4 times. This will "swish and bump" the filter allowing the D.E. and dirt to intermix with the water within the filter chamber. Stand clear of the filter and restart the pump and the flow will be back to normal and the pressure gauge will be at the low reading.

5-CLEANING - After a number of weeks it will be noted that the flow is reduced in about 1 day, after regeneration which means that the ratio of dirt to D.E. is such that full cleaning is needed. To clean the filter, shut off the pump, and relieve internal pressure. Quickly "swish and bump" using the filter knob only 4 times. Open the air relief valve and the drain plug. Wait until the filter is completely empty, replace the drain plug keeping the air bleeder open and stand clear of the filter. Turn the pump on and completely fill the filter with water. Shut off the pump and relieve the internal pressure. "Swish and bump" another 4 times and again allow the filter to drain. Close the drain plug and follow the Initial Start-Up instructions above to begin a new filter cycle.

CLEANING OF GRID ASSEMBLY

6-Due to pool water chemistry, a build up of minerals and oil may form deposits on the fabric of the grids. This will eventually result in shortened filter cycles. To clean the fabric proceed as follows.

F. DISASSEMBLY AND FILTER MANUAL CLEANING PROCEDURE

NOTICE: At least once a year, disassemble and clean filter regardless of operating pressure readings. This can be done conveniently while winterizing the pool in cold climates.

1-Clean the filter as discussed above in Step 5 as recommended but do not precoat with the new D.E.

2-STOP PUMP

3-OPEN air release valve.

WARNING

RELEASING CLAMP WITH PRESSURE ON SYSTEM WILL BLOW LID OFF THE TANK, CAUSING SEVERE INJURY OR MAJOR PROPERTY DAMAGE!!

4-WAIT until all pressure is released from filter tank and system before loosening clamp.

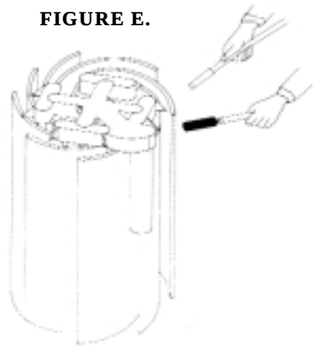
5-Remove the clamp and top half of the filter.

6-Grasp element assembly at top manifold using hand holds and life to remove it. Figure D.

FIGURE D.

7-Hose down element assembly and clean with bottle brush (Figure E). Use detergent solution of filter cleanser available from a pool service store.

FIGURE E.



NOTICE: To avoid damaging fabric, do not allow filter element to rub on concrete or any abrasive surface during cleaning.

NOTICE: Do not expose element cloth to direct sun for long periods. Direct sun will cause the cloth to deteriorate.

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H. TROUBLESHOOTING

Problem	Cause	Remedy
Pool water not sufficiently clean.	1. Pool chemistry not adequate to inhibit algae growth.	Maintain pool chemistry or consult pool service technician.
	2. Dirty Filter.	Regenerate filter or clean if necessary. Use chemical cleaning of grid assembly if necessary.
	3. Inadequate turnover rate.	Run system for longer time or consult dealer or pool service technician.
High Filter Pressure.	1. Dirty Filter.	Regenerate filter or clean if necessary. Use chemical cleaning of grid assembly if necessary.
	2. Partially closed valve or restriction.	Open valve or remove obstruction in return line.
Short Cycles.	1. Dirty Filter.	Regenerate filter or clean if necessay. Use chemical cleaning of grid assembly if necessary.
	2. Pool Chemistry not adequate to inhibit algae growth.	Maintain pool chemistry or consult pool service technician.
	3. Flow rate too high.	Restrict flow to capacity of filter.
Return flow to pool diminished, low filter pressure.	1. Obstruction in pump hair and lint strainer.	Clean basket in strainer.
	2. Obstruction in pump.	Disassemble and clean pump.
	3. Obstruction in suction line to pump.	Clean skimmer basket. Remove obstruction in lines. Open valves in suction line.
Dirt or DE returning to pool.	1. After regenerating and re-coating the filter with D.E., some amount of "puffback" is normal.	The D.E. will eventually be filtered out of the pool. No action necessary.
	2. Grid assembly not properly located on center pipe.	Check assembly for proper location.
	3. Grid Element torn.	Insure that Grid Assembly is installed properly. Check for breaks in polyester material. Replace if necessary.
	4. Air strainer on manifold is damaged or missing.	Replace.
	5. Missing or defective check valve.	Install or repair check valve.
Leakage at clamp.	1. Improperly tightened clamp.	Shut off pump, relieve tank pressure, open air bleeder. Tighten clamp properly.
	2. Dirt or contamination on the "O" Ring on sealing surface.	Shut off pump, relieve tank pressure, open air bleeder. Remove tank top, clean "O" Ring sealing surfaces. Reassemble tank properly.
	3. Damaged or cut "O" Ring.	Same as above except replace "O" Ring.