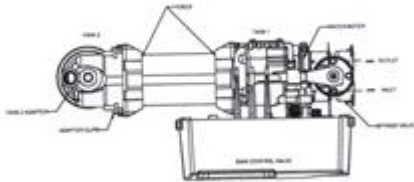


Rayne Smart Twin Tank Water Softener

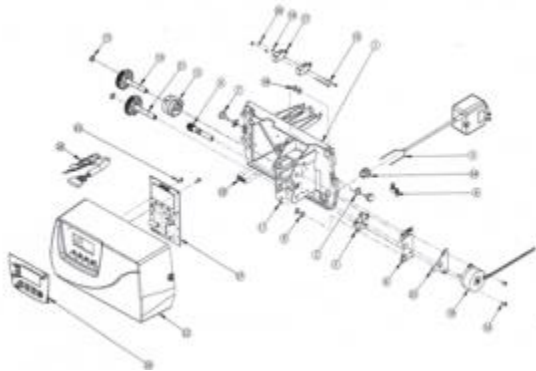
9100 TS UPFLOW SERVICE MANUAL (PENTAIR WATER)



9100 TS Configuration



POWERHEAD ASSEMBLY



Item No.	QTY	Part No	Description
1	1	15131	Backplate, 9000
2.....	2	18728.....	Nut, Clip, #8-32

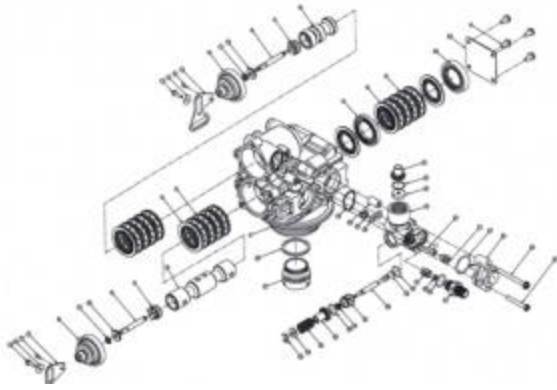
3.....1.....	19674.....	Transformer, US 24V 9.6VA
4.....1.....	15135	Gear, Drive
5.....1.....	14869.....	Wheel, Geneva
6.....2	40422.....	Nut, Wire, Tan
7.....2	19367.....	Screw, Designer Cover, Thumb
8.....1.....	43085.....	Label, Shaft Position
9.....2	14917.....	Retaining Ring, External
10.....1.....	15133.....	Drive GearAssembly – Upper
11	15810.....	Retaining Ring
12.....1	43091	Cam, Triple 9100 TS
13.....2.....	15372.....	Washer, Thrust
14.....1.....	14430.....	Screw, Hex Washer Head
15.....2	19160.....	Screw, #6-32 x 318 Pan Head
16.....2	15172.....	Scrw, Flat Head

Item No	QTY	Part No	Description
17.....2		10340.....	Washer, Lock #4, Zinc
18.....1.....		16433.....	Switch, Micro Low DB
19.....1.....		10218.....	Switch, Micro
20.....2		15692.....	Washer, Plain, 3/8"
21.....2		10302.....	Insulator, Limit Switch
22.....1.....		18737.....	Drive Motor -24V, 50-60 Hz
23.....2		10339.....	Nut, Hex, 4-40 Zinc Plated
24.....1		15134.....	Drive Gear Assembly – Lower
25.....1.....		43006.....	Cover, 9100 TS
26.....1.....		43035.....	PCB, 9100 TS
27.....2		17020.....	Screw, STL. Hex WSH, 6-20 x 3/8
28.....1.....		13547.....	Strain Relief, Cord
29.....1.....		42296-10.....	Plate, Adapter, Motor Kit
30.....1		43056.....	Label, Overlay, 9100 TS

311 43112.....Label, Sensor Wires 9100TS

9100 TS Upflow

9100 CONTROL VALVE ASSEMBLY



Item No.	QTY	Part No	Description
1	.....1...	40686	..... Valve Body Assy, 9100
2	.....16	..... 13242	.....Seal, 5600
3	.....12	..... 14241	.....Spacer
4	.....1	..... 16595	..... . Spacer, 9000
5	.....4	..... 15331	.....Screw, Hex Washer Head
6	.....1	..... 14914	.....Piston, 9000, Upper
7	.....2	..... 14309	.....Retainer, Piston Rod
8	.....2	..... 14919	.....Piston, Rod, Upper
9	.....2	..... 13243	.....Plug, End, 5600
10	.....2	..... 13008	.....Retainer, End Plug Seal
11	.....2	..... 10209	.....Quad Ring, -010
12	.....1	..... 14921	.....Link, Piston Rod
13	.....2	..... 11335	.....Screw, #4-40
14	.....2	..... 17020	.....Screw, STL. Hex WSH, 6-20 x3/8
15	.....2	..... 13363	.....Washer, Hague Drive
16	.....1	..... 28170	.....Piston Lower, 9100T5
17	.....1	..... 15019	.....Link, Piston Rod, 9000/9500

18.....1 415000-ring, 9100 Drain
 19.....1 15215.....Body, Injector, 9000
 20.....2 133010-nng,-011
 21.....1 1091 3-1.....Nozzle, Injector, #1, Natural
 22.....1 10914-1Throat, Injector
 23.....1 13303.....0-ring, -021
 24.....1 15607.....Screw, Hex, Slotted
 25.....1 25363.....Screw, Hex WSH HD
 26.....1 153480-ring, -563

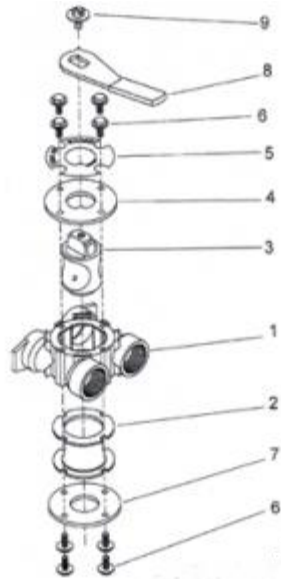
Item No	QTV	Part No	Description
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27.....1	13173.....	Retainer, DLFC Button
28.....1	12085.....	Washer, Flow, 1.2 gpm
29.....1	14925.....	Brine Valve Stem, 9000
30.....1	12626.....	Seat, Brine Valve
31.....1	13167.....	Spacer, Brine Valve
32.....1	13165.....	Cap, Brine Valve
33.....1	11973.....	Spring, Brine Valve
34.....1	11981-01	Ring, Retaining, S\$
35.....1	16098.....	Washer, Nylon Brine
36.....1	12977	0-ring, -015
37.....1	13245.....	Retainer, BLFC
38.....1	12095.....	Washer, Flow Control, .50 gpm
39.....1	12550.....	Quad Ring, -009
40.....2	13302	0-ring, -014
41.....1	13244.....	Adapter, BLFC
42.....1	13497.....	Air Dispenser, Injector
45.....1	13361	Spacer, 4600
46.....1	40538.....	Retainer, 32 mm, 0-ring Dist,

7000

- 47.....1 61419..... Kit, 1.05" Distributor Adapter
- 48.....1 14906..... Plate, End, 9000
- 49.....1 14928..... Plug, End Stub, 9000
- 50.....1 60285-01 Injector Cap Assy, 9100 TS
- 50.....1 10227..... Screen, Injector

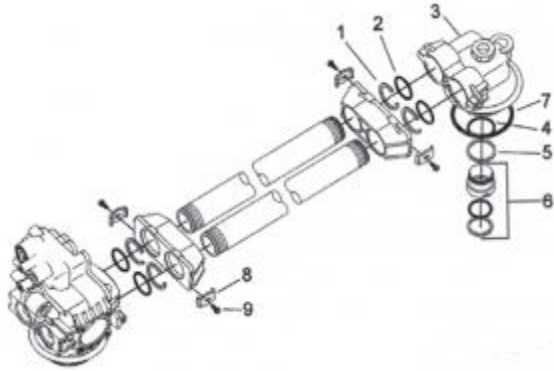
9000/9100 BYPASS VALVE ASSEMBLY



Item No.	QTY	Part No	Description
1	1	17290	By-Pass Body, 3/4"
		17290NP	BY-Pass Body, 3/4" NP, 5600
1		13399	By-Pass Body, 1"
1		13399NP	By-Pass Body, 1" NP
2	1	14105	Seal, By-Pass, 560CD
3	1	11972	Plug, By-Pass, w/Wax
4	1	11978	Plate, By-Pass, Top
5	1	13604-01	Label, By-Pass, Standard Mount
6	8	15727	Screw, Hex WshHd, 10-24x1/2
7	1	11986	Plate, By-Pass, Bottom
8	1	11979	Lever, By-Pass

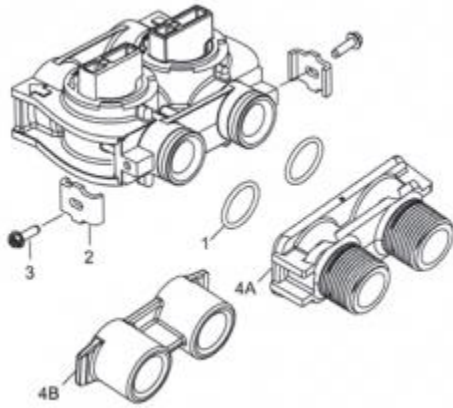
9.....1 11989..... Screw, Sltd Indent, 1/4- 14x 1 1/2

9100 SECOND TANK ASSEMBLY



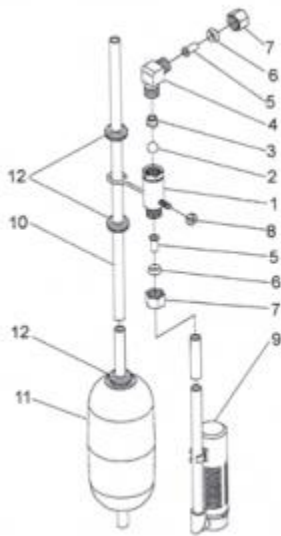
Item No	QTY	Part No.	Description
1	4	40678	Ring, 9100, Yoke Retainer
2	4	13287	O-ring, -123
3	1	14865	Adapter Assy, 2nd Tank, 9100
4	1	19054	O-ring, -124
5	1	40538	Retainer, 32mm, O-ring Dist, 7000
6	1	61419	Kit, 1.05' Distributor, Adapter
7	1	18303	O-ring,-336
8	4	13255	Clip, Mounting
9	4	14202-01	Screw, Hex Wsh Mach, 8-32 x 5/16

BYPASS VALVE ASSEMBLY



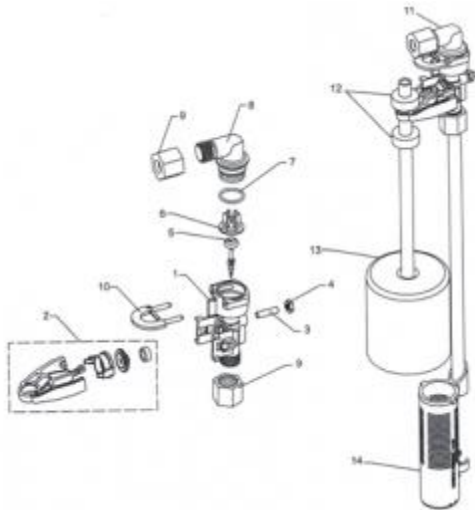
Item No.	QTY	Part No.	Description
1	2	13305	O-ring, -119
2	2	13255	Clip, Mounting
3	2	13314	Screw, Slot Ind Hex, 8-18 x.60
4A	1	18706	Yoke, 1", NPT, Plastic
1		18706-02	Yoke, 3/4", NPT, Plastic
4B	1	41027-01	Yoke, 3/4", NPT, Cast, Machd
1		41026-01	Yoke, 1", NPT, Cast, Machd, SS

2300 SAFETY BRINE VALVE



Item No.	QTY	Part No.	Description
1.....	.....1	..... 60027-00.....	Safety Brine Valve, 2300, Less Elbow
2.....	.....1	..... 10138.....	..Ball, 3/8", Brass
3.....	.....1	..... 11566.....	Ball Stop, Slow Fill
4.....	.....1	..... 10328.....	Fitting, Elbow, 90 Deg. 1/4 NPTx 3/8T
5.....	.....1	..... 10332.....	Fitting, Insert, 3/8
6.....	.....1	..... 10330.....	Fitting, Sleeve, 318 Celcon
7.....	.....1	..... 10329.....	Fitting, Tube, 3/8 Nut, Brass
8.....	.....1	..... 10186.....	Nut, Hex, 10-32
9.....	.....1	..... 60002.....	Air Check, #500
10.....	.....1	..... 10149.....	Rod, Float
11.....	.....1	..... 10700.....	Float Assy, Blue/White
12.....	.....3	..... 10150.....	Grommet, .30 Dia

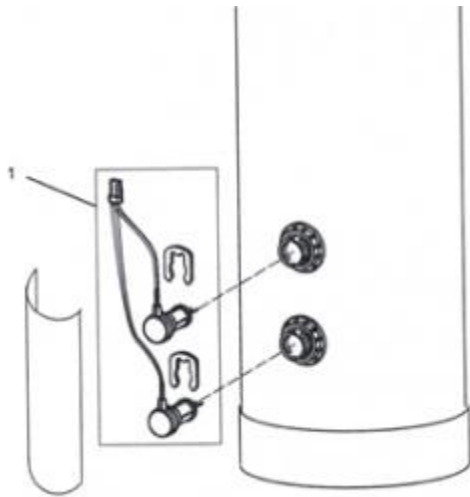
2310 SAFETY BRINE VALVE



Item No.	QTY	Part No	Description
1	.....	..... 19645.....	Body, Safety Brine Valve, 2310
2.....	.....1	..... 19803.....	Safety Brine Valve Assy
3.....	.....1	..... 19804.....	Screw, Sckt Nd, Set, 10-24 x.75

- 4.....1 19805..... Nut, Hex, 10-24, Nylon Black
- 5.....1 19652-01 Poppet Assy, SBV w/0-ring
- 6.....1 19649..... Flow Dispenser
- 7.....1 11183 O-ring, -017
- 8.....1 19647..... Elbow, Safety Brine Valve
- 9.....2 19625 Nut Assy, 3/8" Plastic
- 10.....1 18312..... Retainer, Drain
- 11.....1 60014..... Safety Brine Valve Assy, 2310
- 12.....2 10150..... Grommet, .30 Dia
- 13.....1 60068-30..... Float Assy, 2310, w/30" Rod
- 14.....1 60002-34..... Air Check, #500

PROBE KIT



Item No.	QTY	Part No.	Description
1	1	30212618	Probe/Cable/Clips Kit

TROUBLESHOOTING

Problem	Cause	Correction
Water conditioner fails to regenerate.	A. Electrical service to unit has been interrupted	A. Assure permanent electrical service (check fuse, plug, pull chain, or switch)

Timer is defective. B. Replace timer.

Power failure. C. Reset time of day.

Hard water. A. By-pass valve is open. A. Close by-pass valve.

No salt is in brine tank. B. Add salt to brine tank and maintain salt level above water level.

Injector screen plugged. C. Clean injector screen.

Insufficient water flowing into brine tank. D. Check brine tank fill time and clean brine line flow control if plugged.

Hot water tank hardness. E. Repeated flushings of the hot water tank is required.

Leak at distributor tube. F. Make sure distributor tube is not cracked. Check O-ring and tube pilot.

Internal valve leak. G. Replace seals and spacers and/or piston.

Meter is not measuring flow. H. Check meter with meter checker.

Unit used too much salt. A. Improper salt setting. A. Check salt usage and salt setting.

Excessive water in brine tank. B. See problem 7.

Loss of water pressure. A. Iron buildup in line to water conditioner. A. Clean line to water conditioner.

Iron buildup in water conditioner. B. Clean control and add mineral cleaner to mineral bed.

Increase frequency of regeneration.

Inlet of control plugged due to foreign material broken loose from pipes by recent work done on plumbing system.

Remove piston and clean control.

Loss of mineral through drain line. A. Air in water system. A. Assure that well system has proper air eliminator control. Check for dry well condition.

Improperly sized drain line flow control. B. Check for proper drain rate.

Iron in conditioned water. A. Fouled mineral bed. A. Check backwash, brine draw, and brine tank fill.

Increase frequency of regeneration. Increase backwash time.

Excessive water in brine tank. A. Plugged drain line flow control. A. Clean flow control.

Plugged injector system. B. Clean injector and screen.

Timer not cycling. C, Replace timer.

Foreign material in brine valve. D. Replace brine valve seat and clean valve.

Foreign material in brine line flow control. E. Clean brine line flow control.

Softener fails to draw brine. A. Drain line flow control is plugged. A. Clean drain line flow control.

Injector is plugged.

B. Clean injector

Injector screen plugged.

C. Clean screen.

Line pressure is too low.

D. Increase line pressure to 20 P.S.I.

Internal control leak

E. Change seals, spacers, and piston assembly.

Service adapter did not cycle. F. Check drive motor and switches.

Control cycles continuously. A. Misadjusted, broken, or shorted switch. A. Determine if switch or timer is faulty and replace it, or replace complete power head.

Drain flows continuously. A. Valve is not programming correctly. A. Check timer program and positioning of control. Replace power head assembly if not positioning

properly.

Foreign material in control. B. Remove power head assembly and inspect bore. Remove foreign material and check control in various regeneration positions.

Internal control leak. C. Replace seals and piston assembly.

TROUBLESHOOTING for the 9100 TS Controller

Problem	Cause	Solution
ERR I is displayed. reprogram Level I settings.	Program settings have been corrupted.	Press any key and
ERR 3 is displayed. the controller to return to Home position of the camshaft. Camshaft should on the be rotating to find Home position.	Controller on tank 1 does not know the position. The hourglass should be flashing display indicating the motor is running.	Wait for two minutes for
Camshaft on tank 1 is not turning during wire	Check that motor is connected. Verify that motor	
ERR 3 display.	connected to motor and controller module.	
Verify that Home switch sensor is connected and in place.		
Verify that motor gear has engaged cam gear.		

If everything is connected, try replacing in this order:

Wire Harness, Motor, Home Switch, Sensor Assy

Controller

Camshaft on tank 1 is turning more than five minutes to find Home position, connected to wire.

Verify that Home Switch sensor is in place and

Verify that camshaft is connected appropriately.

Verify that no dirt or rubbish is clogging any of the cam

slots.

If motor continues to rotate indefinitely, replace the

following components in this order:

Wire Harness, Motor, Home Switch, Sensor Assy

Controller

Regeneration starts but control shows Err3 connected. Verify that motor wire

Check that motor is

before completing regeneration, controller module.

harness is connected to motor and

Verify that Home Switch sensor is connected and in

place.

Verify that motor gear has engaged cam gear.

If everything is connected, try replacing in this order:

Wire Harness, Motor, Home Switch, Sensor Assy

Controller

ERR 4 is displayed. Hardness front detected with no water flow.

ERR 6 is displayed. Conductivity sensors' reading out of range. Check which tank in service and check if the sensors

Defective sensors or no sensors are have been connected properly. If already connected, connected replace conductivity sensor probes with new ones.

Check Salt Light is displayed – Press No regenerant draw or insufficient Ensure salt/regenerant is available.

the regen button to turn off the check salt light. regenerant detected during regeneration.

Check for regenerant draw.

Inspect regeneration

line for leaks.

9100 TS Upflow

SERVICE ASSEMBLIES

Brine Line Flow Controls (9000/9100):

60022-12BLFC, .125 GPM, 5000/5600/9000/9100

60022-50BLFC, .50 GPM, 5000/5600/9000/9100

60350.....Brine Valve Assy, 9000/9100

Bypass Assemblies:

60040SS Bypass Valve, 5600, 3/4" NPT

60041SS..... Bypass Valve, 5600, 1" NPT

60049..... Bypass Plastic Assy

Injector Assemblies (9000/9100):

61 794-XXXX..... Injector Assembly

(specify size of injector)

Tank Dia.	Injector	DLFC	BLFC
61794-0624	.....8"	Brown #000 1.5	0.125
61794-0634	.....9"	Brown #000 2.0	0.125
61794-0644	.....10"	Brown #000 2.4	0.125
61794-0562	.....12'	Violet #00 3.5	0.5

Meter Assemblies (900019100):

- 15078-01 Adapter, 1" Coupling
- 60086 Meter Assy, 5600/9000/9100, 3/4" Std/
Range
- 60087 Meter Assy, 5600/9000/9100, 3/4", Ext
- 60389 Meter Assy, 9000/9100, 1"
- 60389NP Meter Assy, 9000/9100, 1", N/P
- 60389-20 Meter Assy, 9000/9100, 1", BSP/Metric
- 60390 Meter Assy, 9000/9100, 1", Ext
- 60390NP Meter Assy, 9000/9100, 1", Ext, N/P
- 60390-20 Meter Assy, 9000/9100, 1", Ext/BSP/
Metric
- 60612..... Meter Assy, 9000/9100, 1", Std Range,
HW 150°
- 60612NP..... Meter Assy, 9000/9100, 1", Std Range,
HW 150°, NP
- 14038..... Meter Cap Assy
- 15150..... Meter Cap Assy, Ext
- 15218..... Meter Cap Assy
- 15218NP..... Meter Cap Assy, Std, NP
- 15237..... Meter Cap Assy, Ext
- 15237NP..... Meter Cap Assy, Ext, NP
- 13509..... Impeller, Meter
- 13509-01 Impeller, Celcon, HW 150°

Piston, Seal & Spacer Kits:

- 61785 9100TS Upper Piston Kit
- 61786.....9100TS Lower Piston Kit

Second Tank Assemblies (9000):

- 14202-01Screw, Hex Wsh Mach, 8-32 x 5/16 18-8

S.S.

13255..... Clip, Mounting

15078-01 Adapter Assy, 1" Coupling

14864-01 Adapter, 9000/9100, 2nd Tank, Machd
w/0-rings

14864-01 NPAdapter, 9000/9100, 2nd Tank, Machd,
NP

15823-06 Yoke Assy, 6" Tank & 6" Tube

15823-06NPYoke Assy, 6" Tank, NP 6" Tubes

15823-12 Yoke Assy, 6"- 12" Tank, 8 1/2 Tube

15823-12NPYoke Assy, 6"- 12" Tank, NP 8 1/2"

Tubes

15823-14 Yoke Assy, 14" Tank, 10 1/2" Tube

15823-14NP Yoke Assy, 14" Tank, NP 10 1/2" Tube

15823-16 Yoke Assy, 16" Tank, 12 1/2" Tube

15823-16NPYoke Assy, 16" Tank, NP 12 1/2" Tube

Second Tank Assemblies (9100):

60425-12.....Tube Assy, 9100, 6-12" Tanks

60425-16.....Tube Assy, 9100, 13-16" Tanks

14865.....Adapter Assy, 2nd Tank, 9100

61419.....Kit, 1.05" Distributor Adapter

Tools:

12763.....Stuffer Tool Assy, 5600/9000

13061.....Puller Assy, Port Ring

13759.....Tool, DLFC Retainer

Valve Body Assembly (9100):

40688.....Valve Body Assy, 9100

18303 0-ring, -336 18569.....Retainer, Tank Seal

Cover Assembly (91 OOTS):

61787 Cover Assembly, 9100TS