

# Ultra Pure Systems

## Hydro Cart Compact

Reverse Osmosis / Deionizing water production machines designed for water fed pole window cleaning.

# OPERATIONS MANUAL



**IPC**  
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# System Overview

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The following information is provided to help you understand how the system operates.

- Pure water production volume on any Reverse Osmosis system is temperature dependant.
  - Colder feed water, i.e. the late fall, winter and early spring will produce a lower volume (gpm) of pure water.
  - Warmer water, i.e. late spring, summer and early fall will produce a higher volume (gpm) of pure water.
- The reverse osmosis (RO) portion of this system will remove 94% to 98% of the total dissolved solids (TDS) from the feed water. The amount that is removed depends on several factors such as water temperature, pressure, water quality, care of membrane and outside conditions. New membranes may take some time to soak and provide more efficient removal of dissolved solids.
  - Example: if your supply water is 200 parts per million (200 ppm) at a removal rate of 98% then the RO product water will be 4 ppm. If your supply water is 700 ppm, then the RO product water will be 14 ppm.
- The RO product water then flows through the deionizing (DI) resin which removes the balance of the dissolved solids, giving you water at 0 ppm TDS. The DI resin acts like sponge that absorbs dissolved solids. Once it is full, it has to be replaced.
- The Carbon/Sediment filter removes all solid particles larger than 5 microns in size from the feed water. In addition, it removes the chlorine from the feed water. Chlorine will damage the RO membranes and make them ineffective. The carbon block can only hold a finite amount of chlorine. It must be replaced after 5,000 gallons of feed water have passed through it or 30 hours.
- Short term and long term storage is an important issue. The system must be protected from algae and bacteria growth in the pressure vessels caused by stagnant water. The membranes and DI resin must not be allowed to dry out either. Please see the **Storage** section in this manual for proper instructions.
- The unit must be protected from freezing.

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## New Machine Setup Procedure

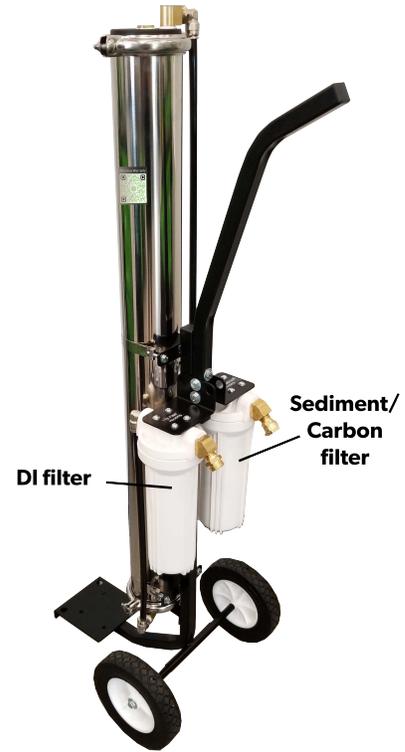
1. **Unpack unit** and inspect machine for shipping damage.
2. **Take inventory** of the following items shipped along with the unit.
  - Qty. 1 - RO membrane (installed).
  - Qty. 1 - DI resin cartridge (Not installed).
  - Qty. 1 - Carbon/Sediment filter cartridge (installed).
  - Qty. 1 - Small filter housing wrench.
  - Qty. 1 - 50 ft. hose for pure water to pole.
  - Qty. 1 - Magic Lube - o-ring lubricant.
  - Qty. 1 - TDS meter.
  - Qty. 1 - RO Protect Membrane Storage.
  - Qty. 1 - Waste water hose.

# Filter Installation



## Carbon Sediment cartridge Installation:

- The **5 micron carbon/sediment filter cartridge** is the first filter the feed water goes through. Install it in the housing on the right side, next to the water supply hose inlet fitting.
1. Slide the small filter housing wrench up from under the bottom of the white housing and turn CCW to loosen. Remove the tool and spin housing completely off.
  2. Lubricate o-ring on housing with Magic Lube o-ring lubricant.
  3. Remove plastic wrapping on new filter cartridge. Position center hole on shouldered ring on bottom of housing.
  4. Screw housing into base and tighten with small filter housing wrench. Do not overtighten.



## DI resin cartridge Installation:

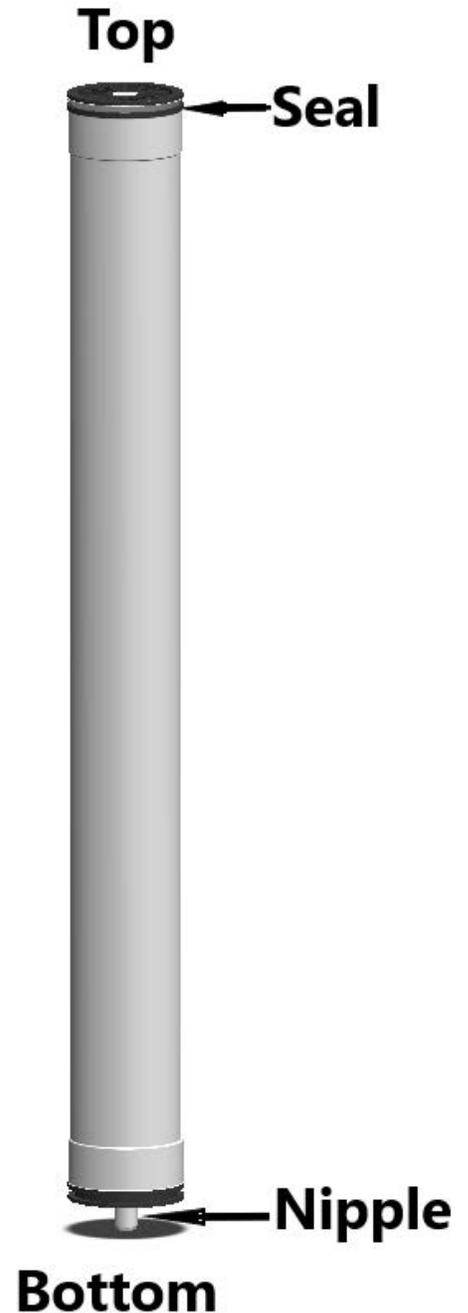
The **DI filter cartridge** is the final filter and removes the rest of the impurity's after the RO. Install it in the housing on the left side, next to the pure water discharge fitting.

1. Slide the small filter housing wrench up from under the bottom of the white housing and turn CCW to loosen. Remove tool and spin housing completely off.
2. Lubricate o-ring on housing with Magic Lube o-ring lubricant.
3. Remove cartridge from the sealed bag and place into housing with seal washer in the up position and locate the bottom hole on shouldered ring inside the bottom of the housing.
4. Screw housing into base and tighten with filter housing wrench. Do not overtighten.

# RO Membrane Replacement



1. Disconnect the black hose from the top cap of the RO housing.
2. Remove the clamp holding the top cap on.
3. Remove the top cap by using a screwdriver to pry the top cap up. There are two notches on opposite side of each other to pry cap up. Be careful not to damage.
4. Remove RO membrane by using needle nose pliers. Grab one of the spokes and pull up.
5. Apply Magic lube to the bottom nipple and top seal of the RO membrane.
6. Insert membrane into pressure vessel, nipple goes down and the seal is at the top.
7. Apply Magic lube to the o-rings on the cap and install on pressure vessel.
8. Install the clamp to hold cap on.
9. Install black hose.



# HydroCart Compact Operating Instructions



## SETUP

1. The machine may be operated standing upright or lying down. Choose the position that offers the most stability at the job site.
2. Choose a location close to the water supply tap if possible. Extension garden hoses may be used but must be 5/8 inch inside diameter or larger to minimize line pressure loss. Additional extension garden hoses may decrease system volume production rate.

## STARTUP

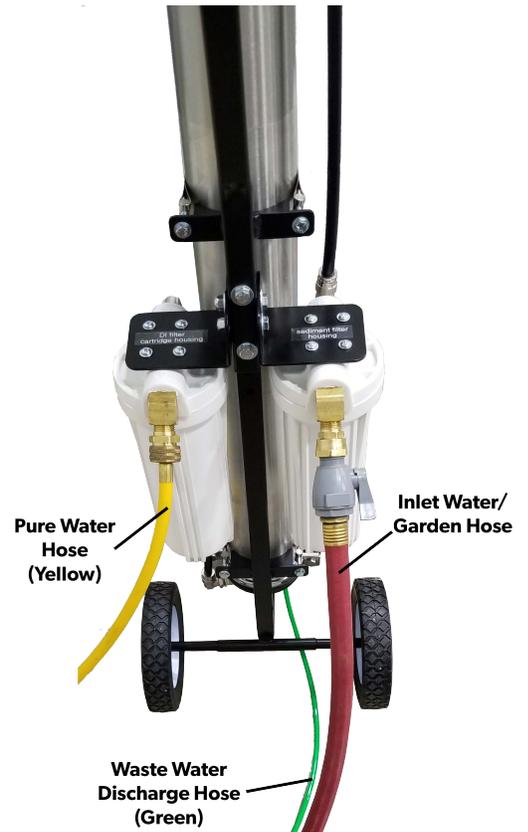
1. Connect water supply garden hose to feed water inlet connection.
2. Connect the yellow 50 ft hose to pure water outlet connection.
3. Connect wash pole hose to the other end of the 50 foot hose.
4. Connect waste water hose to an area that can accept the water such as shrubs, trees, grass or drainage that leads to a storm drain. Attach an extra garden hose if needed to reach the desired area.

**Note:** The waste water will not harm any plant life. It is just tap water with a higher total dissolved solids content.

5. Turn on water supply.
6. Test water at the brush using the handheld TDS meter. Water should be less than 10 ppm.
7. Use the ball valve at the pole to adjust desired amount of pure water supplied to brush.

## SHUTDOWN

1. Turn supply water off.
2. Let the water drain out of the waste water hose.
3. Connect the end of the waste water hose to the inlet of the Carbon/Sediment filter for transport and to keep the system from drying out.



# Maintenance



## DAILY

**IMPORTANT:** After the last use of the day, drain the RO membrane by letting water flow out of the waste water hose after removing supply water. This will help flush the concentrated water from the membrane and increase the life of the membrane. Reconnect to the inlet to keep system from drying out.

## CARBON/SEDIMENT FILTER

Change every 5000 gallons of feed water run through the machine, or roughly 30 hours. It is recommended to replace the carbon filter when the DI resin cartridge is replaced to assure protection of the RO membrane.

## DI RESIN CARTRIDGE

The life expectancy of the DI resin cartridge is based on the TDS level of the RO water going into it. The RO will remove up to 98% of the TDS from the feed water.

Example: The feed water supply from a garden hose at your job site has a TDS of 300 ppm. The RO removes 98%, so the water going into the DI resin cartridge will be at 6 ppm. (2% of 300 ppm)

The TDS levels of the feed supply water can vary at each job site due to the water coming from different sources. The chart below will give you an estimated life based on an average of the supply water.

The supply water temperature will affect the pure water production rate from the RO. This will affect the estimated reading for DI cartridge replacement as well. Test the water daily, if it goes beyond 10 parts per million change your DI cartridge.

Pure Water Flow			
	Rate (gpm)	% Rejection rate	Rate
	0.75	98	0.02
	1200		
Supply TDS (ppm)	Capacity Total Gallons	Life Expectancy Hours of use	\$62.29 Cost/Gallon
50	6483.8	144.08	\$0.01
100	3241.9	72.04	\$0.02
150	2161.3	48.03	\$0.03
200	1620.9	36.02	\$0.04
250	1296.8	28.82	\$0.05
300	1080.6	24.01	\$0.06
350	926.3	20.58	\$0.07
400	810.5	18.01	\$0.08
450	720.4	16.01	\$0.09
500	648.4	14.41	\$0.10

# RO Protect™

## RO Membrane Protection & Storage Solution

- A** Set green discharge hose onto the ground and let waste water flow out of the system.



- B** Pour entire package of RO Protect™ into 1gallon of pure water or distilled water, mix thoroughly ensuring all powder has been dissolved.



Note: RV antifreeze (propylene glycol) may be used if freeze protection for system is required.

### Ultra Pure series Hydro Cart Compact long term storage instructions

#### System Preparation:

1. Remove sediment filter and carbon filter, empty water. Reinstall empty housings.
2. Set green waste water hose on ground to drain system empty. (see fig. A)
3. Remove cap on top of RO pressure vessel.
4. Remove DI resin cartridge. Reassemble empty DI pressure vessel.
5. Allow DI resin cartridge to drain for an hour. Then wrap it securely in plastic to prevent it from drying out. Store indoors to protect from freezing.

### C



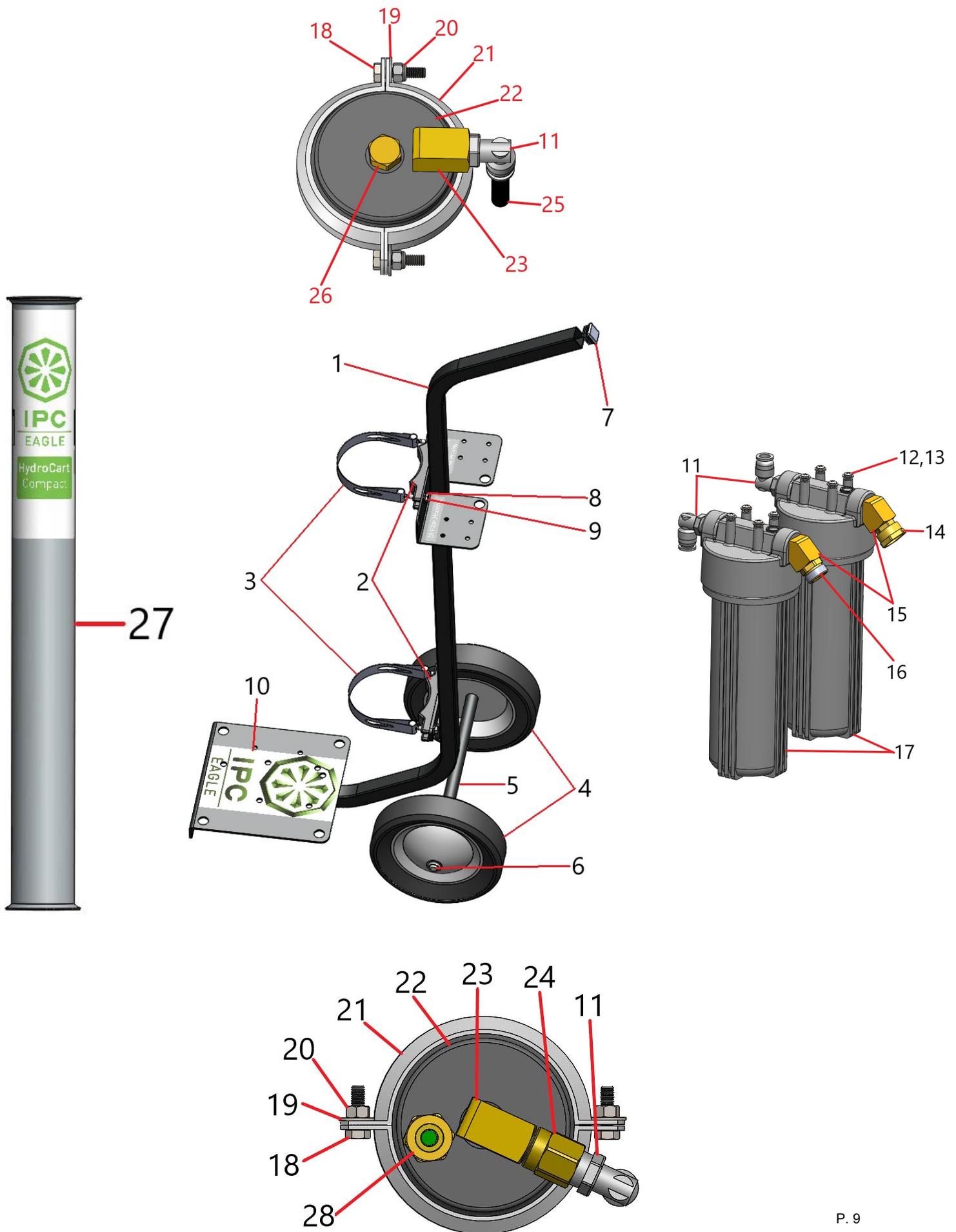
Slowly pour solution into the top of the open RO pressure vessel(s). Reinstall green hose to the inlet when the solution starts coming out.

#### RO Protect Solution preparation and application:

1. Pour entire package of RO Protect™ into 1 gallon of pure water or distilled water, mix thoroughly ensuring all powder has been dissolved. Note: RV antifreeze (propylene glycol) may be used if freeze protection for system is required. (see fig. B)
2. Reinstall green hose to the inlet when the solution starts coming out.
3. Slowly pour solution into the top of the RO pressure vessel(s). (see fig. C)
4. Allow time for solution to settle into the membrane, top off as needed, reinstall all covers and store.

**MSDS** - [www.ipceagle.com/MSDS](http://www.ipceagle.com/MSDS)

# Parts Breakdown - HydroCart Compact



# Parts list - HydrCart Compact

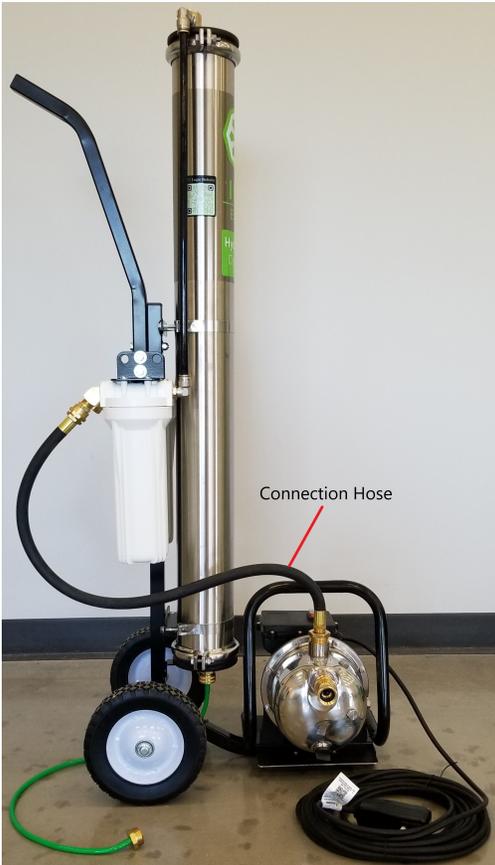
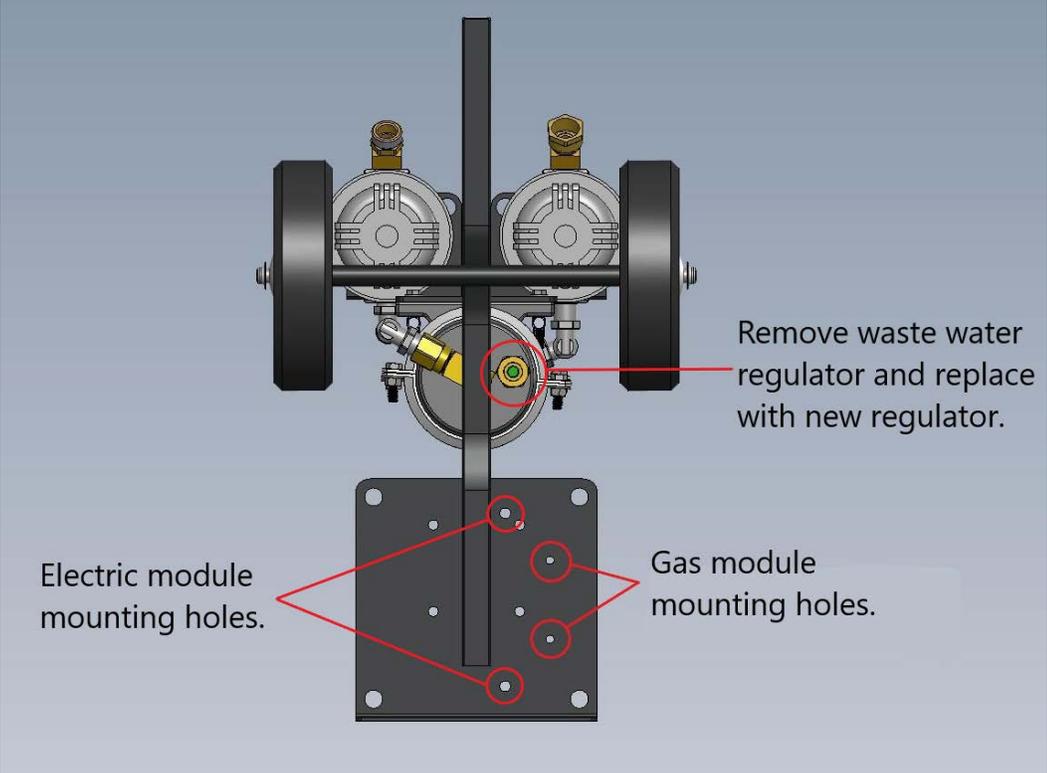
Ref #	Part #	Description	Quantity	Units
1	BD555160	HCC FRAME ASSEMBLY	1	EA
2	BD505135	SADDLE FOR SS VESSEL 4x40	2	EA
3	BD555077	CLAMP, BAND 10"L X 3/4"W S/S	2	EA
4	BD554999	WHEEL, 8" DIA., 1.75 WIDE	2	EA
5	BD555088	AXEL, WCR WASH IT CART	1	EA
6	BD545150	AXLE PUSH NUTS	2	EA
7	BD555076	END TUBE CAP WCR FRAME	1	EA
8	BD431000	WASHER, 1/4" SAE FLAT	4	EA
9	BD410513	BOLT, 1/4-20X1.5" HHCS	4	EA
10	BD555161	HCC PLATE LABEL	1	EA
11	BD500156	1/2" PUSHLOCK X 1/2" NTP MALE	2	EA
12	BD407001	SCREW, #10-14 PHILLIPS PAN	8	EA
13	BD430003	WASHER #10 SAE FLAT	8	EA
14	BD515092	FITTING, 1/2 NPT-M X 3/4 F-GH	1	EA
15	BD515117	FITTING, 1/2" NPT X 45° STREET	2	EA
16	BD515221	FITTING, 1/2" NPT-M X 3/4" GH	1	EA
17	BD505104	SLIMLINE PREFILTER HOUSING	2	EA
18	BD411511	BOLT, 5/16-18X1.25" HHCS	2	EA
19	BD432001	WASHER, 5/16"	4	EA
20	BD442000	NUT, 5/16-18 NYLOCK	2	EA
21	BD505129	CLAMP SET 4040 SS VESSEL	2	EA
22	BD505138	END CAP 4040 SS VESSEL	2	EA
23	BD515058	FITTING, 1/2" NPT 90° STREET	2	EA
24	BD515220	CHECK VALVE, 1/2" NPT MALE	1	EA
25	BD500157	1/2" PUSHLOCK HOSE, NYON BLACK	3.5	FT
26	BD515069	FITTING, 1/2" NPT HEX PLUG,	1	EA
27	BD505136	PRESSURE VESSEL 4040 S/S	1	EA
28	BD500104	WASTE WATER REGULATOR	1	EA

## Items Not Shown

BD500253	FILTER SET FOR HCC	1	EA
BD500573	DI CARTRIDGE, 2.5X10	1	EA
BD505108	CARBON BLOCK FILTER	1	EA
BD545132	RO MEMBRANE HYDROTUBE	1	EA
RO PROTECT	RO PROTECT MEMBRANE STORAGE	1	EA
BD545135	HOSE, 50' X 1/4" FOR HYDROTUBE	1	EA
BD500151	ASSY, WASTE WATER HOSE WCR	1	EA
BD515214	FILTER WRENCH, SMALL	1	EA
BD515153	MAGIC LUBE	1	EA
BD545179	TDS METER	1	EA
BD505014	BALL VALVE 3/4" F GHx3/4" M GH	1	EA
BD505128	O-RING END CAP SS VESSEL	2	EA

# Hydrocart Compact Module Installation Instructions

- 1. Remove waste water regulator and replace with new regulator included in kit.
- 2. Locate mounting holes and punch hole in label. Bolt module to mounting plate.
- 3. Install connection hose from pump discharge located on top of pump to inlet of Hydrocart.



# Operating Instructions

**DO NOT SHUT PURE WATER OFF  
DURING OPERATION OF MODULES.**

## Electric Module operating instructions:

1. Connect supply water to inlet of pump.
2. Plug in unit. Make sure GFCI is set.
3. Turn on water supply and let water flow until you see water come out of waste water hose on cart.
4. Turn on pump using switch on top of pump.
5. Check for correct operation of unit.
6. Turn off pump before shutting off water supply. Do not run pump without water.

## Gas Module operating instructions:

1. Read engine operations manual.
2. Connect supply water to inlet of pump.
3. Turn on water supply and let water flow until you see water come out of waste water hose on cart.
4. Turn on ignition switch.
5. Close choke.
6. Set throttle to max.
7. Start engine.
8. Check for correct operation of unit.
9. Shut off engine before shutting off water supply.  
Do not urn pump without water.

# Troubleshooting Procedures

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## Condition

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## Solution

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**Low supply water flow or pressure**

1. Eliminate all extension hoses and connect directly to spigot with a single hose.
  2. Check for blockage or kinks in hose.
  3. Connect to different water source.
  4. Clean or replace sediment filter.
- 

**High wastewater flow with low pure water flow good system pressure**

1. Remove DI cartridge and retest
  2. Extremely cold water supply
  3. Plugged RO membrane – Replace RO membrane
- 

**High pure water TDS and/or high pure water flow**

1. Damaged membrane –replace
  2. Membrane installed upside down
- 

**Low System pressure with low waste water flow**

1. Verify supply water conditions
2. Clean or replace carbon sediment filter.
3. Damaged pump – replace pump

# Troubleshooting Procedures

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## **System performance evaluation:**

In order to properly evaluate and troubleshoot the system, you will need to perform a complete set of tests on the unit. These tests will help identify the cause of the problem. To run these tests, you will need the following items:

- Watch or clock with a sweep second hand.
- 3 gallon bucket.
- Volume measurement method. This could be volume graduation marks inside the bucket or a measuring cup/container.

## **Flow testing procedure:**

- With water running from hose being tested, direct flow into bucket for exactly 1 minute while timing with watch.
- Measure volume of water and record the gallons per minute flow rate.
- If water volume is very low, perform a 2 - minute test and divide flow by 2.
- If water volume is more than your bucket can hold in 1 minute, take a 30 second flow test and multiply the result by 2.
- Record the results in gpm (gallons per minute).

Use this procedure for all of the required flow tests as listed in the following **System Testing** section.

# System Testing



1. Set up unit to run as per operation/owners manual. Remove DI cartridge filter before testing and reattach DI cartridge housing housing.
2. Before connecting the supply water hose to the machine, measure the water flow from the end of the hose(s).
  - Supply water flow \_\_\_\_\_ gpm
3. Measure the TDS and temperature of the supply water.
  - Supply water TDS \_\_\_\_\_ ppm
  - Supply water temperature \_\_\_\_\_ °C
4. Connect the supply water hose to the machine and turn on the water.
  - Supply water pressure \_\_\_\_\_ psi
5. Place green waste water hose on the ground to allow water to flow onto the ground or into a drain. For testing purposes, do not connect a pole hose. Wait for 1 minute to allow system to stabilize.
6. Measure the water flow from the wastewater hose.
  - Wastewater flow \_\_\_\_\_ gpm
7. Measure the water flow from the pure water hose.
  - Pure water flow \_\_\_\_\_ gpm
8. Measure the TDS of the pure water.
  - Pure water TDS \_\_\_\_\_ ppm
9. Measure the TDS of the wastewater.
  - Wastewater TDS \_\_\_\_\_ ppm
10. Turn off machine water and compare test results to normal operation specifications on page 12.

# System Analysis



The following information of flows and pressures are median values for the system. All system parameters will vary due to water supply temperature and TDS level. System setup may also affect the readings. i.e. extension cord size and length, hose lengths and diameters. It is imperative to connect the machine directly to the water and power source when evaluating performance.

Description	Actual	Normal
<u>Supply water</u>		
Flow	_____	4 gpm minimum
TDS	_____	Check with local water authority
Temperature	_____	Varies by season and region
Pressure	_____	40 psi minimum

## Specifications

System operating pressure	_____	40psi minimum
Wastewater flow	_____	0.5 gpm
Wastewater TDS	_____	Typically 2x higher than fed water
Pure water flow	_____	0.5 gpm minimum
Pure water TDS	_____	Less than 10 ppm

Identify the parameters that are outside of the normal range and use the information in the following troubleshooting matrix to correct the situation.

If after performing all tests and working through the matrix you still have operational issues, **please fill out this form completely** before contacting IPC Eagle Technical Service Department. This information is required for proper evaluation of the system.

# Notes

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# IPC Eagle Warranty Policy

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## Limited Warranty

IPC Eagle warrants new cleaning equipment against defects in material and workmanship under normal use and service to the original purchaser as detailed below.

### 1 year

Subject to the conditions stated below, IPC Eagle warrants all other cleaning equipment components to be free from defects in materials and workmanship for a 1-year period. Parts replaced or repaired are warranted for the remainder of the original warranty period. Batteries are pro-rated for one year.

IPC Eagle will furnish and charge for replacement parts, including transportation, to the original owner through an IPC Eagle authorized service center. If the part is returned within 30 days and is found defective, the owner will be credited for the cost of the replacement part including shipping and handling.

Wear items exempt from warranty include belts, carbon brushes, power cords, wheels, handle grips, filters, and screens.

This warranty shall not apply to failures caused by misuse or abuse, improper maintenance as stated in the operation manuals, use of unauthorized repair parts, repairs by other than an IPC Eagle authorized service center, and damage in transit.

IPC Eagle disclaims and denies any liability for any direct, indirect, special incidental or consequential damage which may be suffered as a result of sale, delivery, servicing, use, loss of any product, downtime, labor, freight, or other charges not expressly included herein.



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Thank you for choosing to partner with IPC Eagle. Your IPC Eagle Product has been thoroughly tested and inspected and is warranted to be free of defects in material and workmanship for a specific period, depending on the product purchased. This warranty does not cover normal wear items such as brushes, belts, filters, power cords, squeegee blades, wheels and switches. Other items may apply or not apply based on your specific IPC Eagle unit.

If such defects occur, this warranty is void if service is attempted by non-authorized IPC Eagle service providers.

To register your product, go online to

**[www.ipcworldwide.com/us/warranty](http://www.ipcworldwide.com/us/warranty)** or scan the QR code below. If preferred, you can call **651-686-5399** to register by phone.

You will need the machine serial number(s) and date of purchase when you register. For future sales on parts or your warranty service, please contact the IPC Eagle distributor you purchased through.

