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AERCO INTERNATIONAL, Inc. Northvale, New Jersey, 07647 USA

## HydroForce Descaler Pumping System

The HydroForce pumping system when used with HydroSkrub Descaler dissolves water scale, lime, mud and rust deposits safely, quickly and effectively

### Features

- 8 gallon HDPE open head bucket
- Mesh hoses, tru-union valves, and essential assorted fittings.
- Seal-less magnetic drive pump
- Compact and Quite
- Energy efficient
- Easy maintenance
- 1-year limited warranty against material defects on HydroForce from original date of shipment

AERCO International HydroForce pumping system is specifically designed to provide the best equipment available to help maintain your equipment in peak operating condition. The compact, quiet, and energy efficient design combined with the high quality components and construction ensure long-term, reliable operation. Our HydroForce is a 3/4" seal-less magnetic twin bearing system centrifugal pump with a totally enclosed non-ventilated permanent magnetic motor producing a maximum flow rate of 4.5 gallons per minute. The pump has a hollow rotating spindle for internal cooling which reduces bearing temperatures and few moving parts ensure easy maintenance.

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### PRECAUTIONS:

Please review MSDS, specifications, and our website [www.aerco.com](http://www.aerco.com) for additional information, or call technical service at (800) 526-0288.

#### **NOTICE**

See Table 1 on page 5 for volume of HydroSkrub needed to clean your AERCO heat exchanger. Mix the amount in the table with an equal volume of water to obtain a 50% concentration of the amount of solution required to flood and circulate throughout the unit.

#### **NOTICE**

If the isolation valves are located more than one foot from the supply and return ports of the exchanger, add in the piping volume from the exchanger to the valves

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### HydroForce Set Up

#### **NOTICE**

Recommended configurations for HydroForce installation are illustrated as follows:

AERCO U-tube Double-Wall	Figure 1
KC1000	Figure 2
Helitherm Water Heaters (A+, SW1B+, WaterWizard, E+)	Figure 3

For SmartPlate water heaters, follow the descaling procedures in Operations and Maintenance Manual SP-100.

1. Turn off the water heater and close all isolation valves.
2. Drain at least half of the Heat Exchanger water-side volume. Refer to Table 1 for heat exchanger volume for each AERCO water heater model.

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3. Close the Drain Valve.
4. Remove all contents from the 8-gallon circulation bucket. This include two 10' hoses, tru-union supply and return valves, bulkhead fittings, accessories kit, and pump.

**NOTICE**

Additional fittings are required for connection to each water heater system as determined by port connections and pipe sizes/types.

5. Attach both 3/4" bulkhead fittings into the predrilled holes at the top and bottom of the circulation bucket with the bulkhead rubber gasket on the inside wall of the bucket.
6. Attach both 3/4" tru-union valves to the newly installed bulkhead fittings via the pre-installed nipples.
7. Thread the lower tru-union valve to inlet side of the pump.
8. Attach one of the 10' hoses to the pump discharge. The opposite end of the hose should be fitted to the bottom of the equipment to be cleaned. Use the "assorted accessory kit" for additional fittings.
9. Screw the union side of the other 10' hose to the return valve located near the top of the bucket that was attached in Step 6. Fit the opposite end of the hose to the top of the equipment to be cleaned. Use the accessory kit if needed.
10. Thread the 90° street elbow to the inside of the top bulkhead fitting.
11. Check that all connections are secure and all appropriate equipment valves are open.

**HydroForce Procedures:**

**NOTICE**

Refer to your HydroSkrub literature at [www.HydroSkrub.com](http://www.HydroSkrub.com), your sales representative and/or our technical department, for the proper HydroSkrub quantities and dilutions for the application.

1. Slowly add prescribed amount of HydroSkrub to the circulating bucket.
2. If recommended quantity exceeds volume of the bucket, turn on pump at this stage.
3. Plug in the pump and periodically check for leaks. Maintain liquid level in the bucket, as a lowering volume indicates an open drain or system. Operating level should be 1/3 of the receiving bucket, the remaining space is for foaming and expansion.
4. Check circuit again. The HydroSkrub solution should flow from the circulation bucket, through the pump and the equipment and back to the top of the bucket.
5. Return discharge foaming indicates active HydroSkrub solution and presence of mineral deposits.
6. Additional HydroSkrub and/or water may be required to maintain circulation and to prevent the pump from cavitating.
7. Circulate through the Heat Exchanger and piping for 1 to 3 hours. Estimate circulation period based on the time in service and water hardness. If heating equipment is more than 40 gallons, circulation time may need to be extended to complete cleaning. When foaming action stops, HydroSkrub strength is depleted (two pounds of deposits removed per gallon used) or the equipment is free from calcium and other water formed mineral deposits.
8. Periodically test the solution for effectiveness to determine if more HydroSkrub is needed—refer to "Testing of Effectiveness of HydroSkrub". If the cleaning solution is expended before circulation time is up, additional HydroSkrub will needed and circulation time may be extended to complete the cleaning.
9. Upon completion, begin flushing procedure by adding water to the circulation bucket, then disconnect return valve from the circulating bucket and thoroughly flush. Continue water flushing the equipment for a minimum of 10 minutes or until discharge runs clear.

10. HydroSkrub is biodegradable, and in most instances may be purged down sewers. Check with local authorities before disposing of any complex compositions.
11. Turn off water and unplug pump and immediately close discharge valves to prevent backflow.
12. Completely drain pump bucket. Disconnect hoses from equipment and liberally rinse bucket, pump, and associated hosing before neatly stowing.

### Testing HydroSkrub Effectiveness

There are two methods of testing the effectiveness of HydroSkrub during cleaning: calcium carbonate spot test of the circulating solution and the charting of a trend in the pH of the cleaning solution.

#### Calcium Carbonate Spot Test

A calcium carbonate spot test is performed by exposing a form of calcium carbonate to the HydroSkrub solution. Samples of the deposit, a Tums or Roloids tablet, or bare concrete can be used. Observe the reaction of the HydroSkrub solution on the calcium carbonate. Foaming and bubbling indicates the solution is still active. Little or no reaction indicates that the solution is

expended. This test should be performed near the end of the circulating time. If the solution has been expended, more HydroSkrub will be required to complete the job. If the solution is still active at the end of the time, all the scale has been dissolved within the application.

#### Charting the pH

The initial pH of the cleaning solution will measure between 1-3 (See pH sheet on HydroSkrub packaging). To test the effectiveness of the circulating solution as a function of pH, take readings at regular intervals and chart as a trend. Note that the deposits can cause a premature jump in the pH.

After circulating for approximately 75% of the cycle time, begin testing the pH at 10-15 minute intervals. Once the solution's pH reads 6.0-7.0 on three or more consecutive readings, the solution is expended. If the pH reads below 6.0 after the circulating time, the application is clean.

### Maintenance and Troubleshooting

For maintenance and troubleshooting, the Pump Manual can be downloaded by clicking [here](http://www.iwakiamerica.com/Literature/MD_WMD/WMDmanual.pdf) or by typing [www.iwakiamerica.com/Literature/MD\\_WMD/WMDmanual.pdf](http://www.iwakiamerica.com/Literature/MD_WMD/WMDmanual.pdf) into your browser.

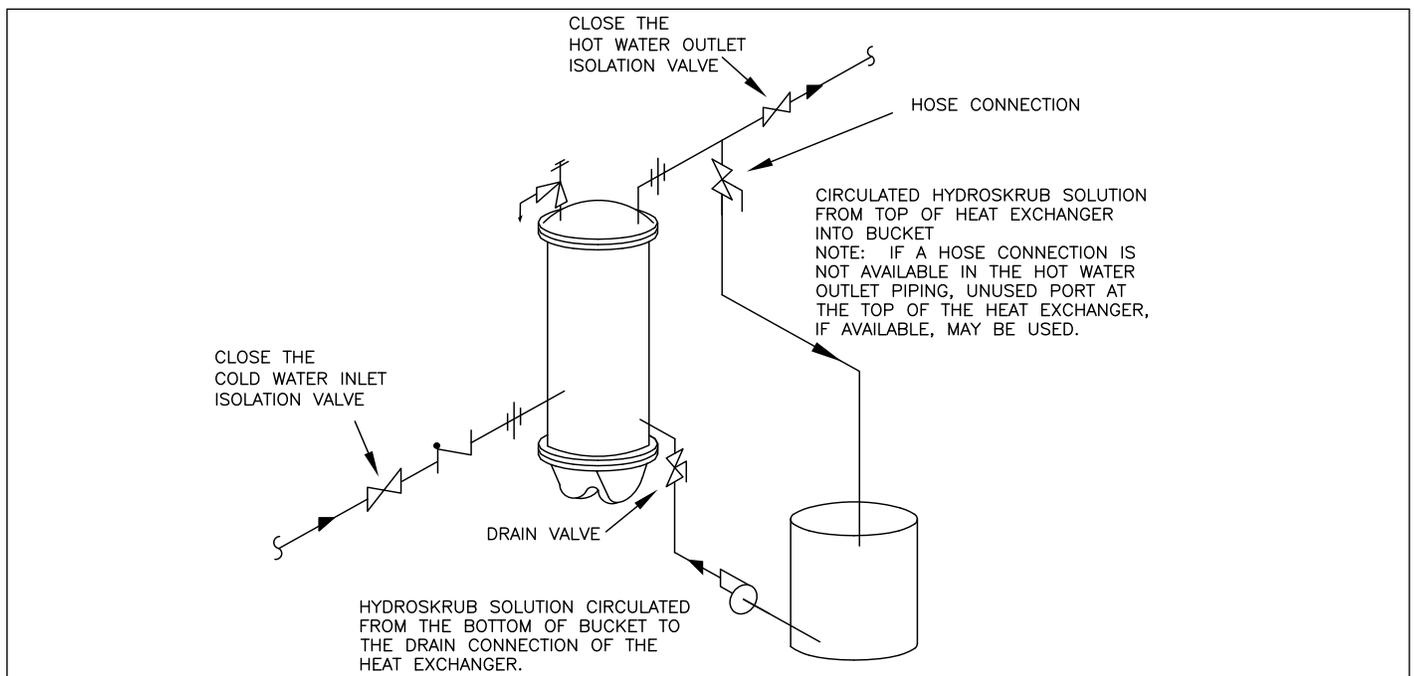


Figure 1: U-Tube Double-Wall Recommended HydroForce Installation

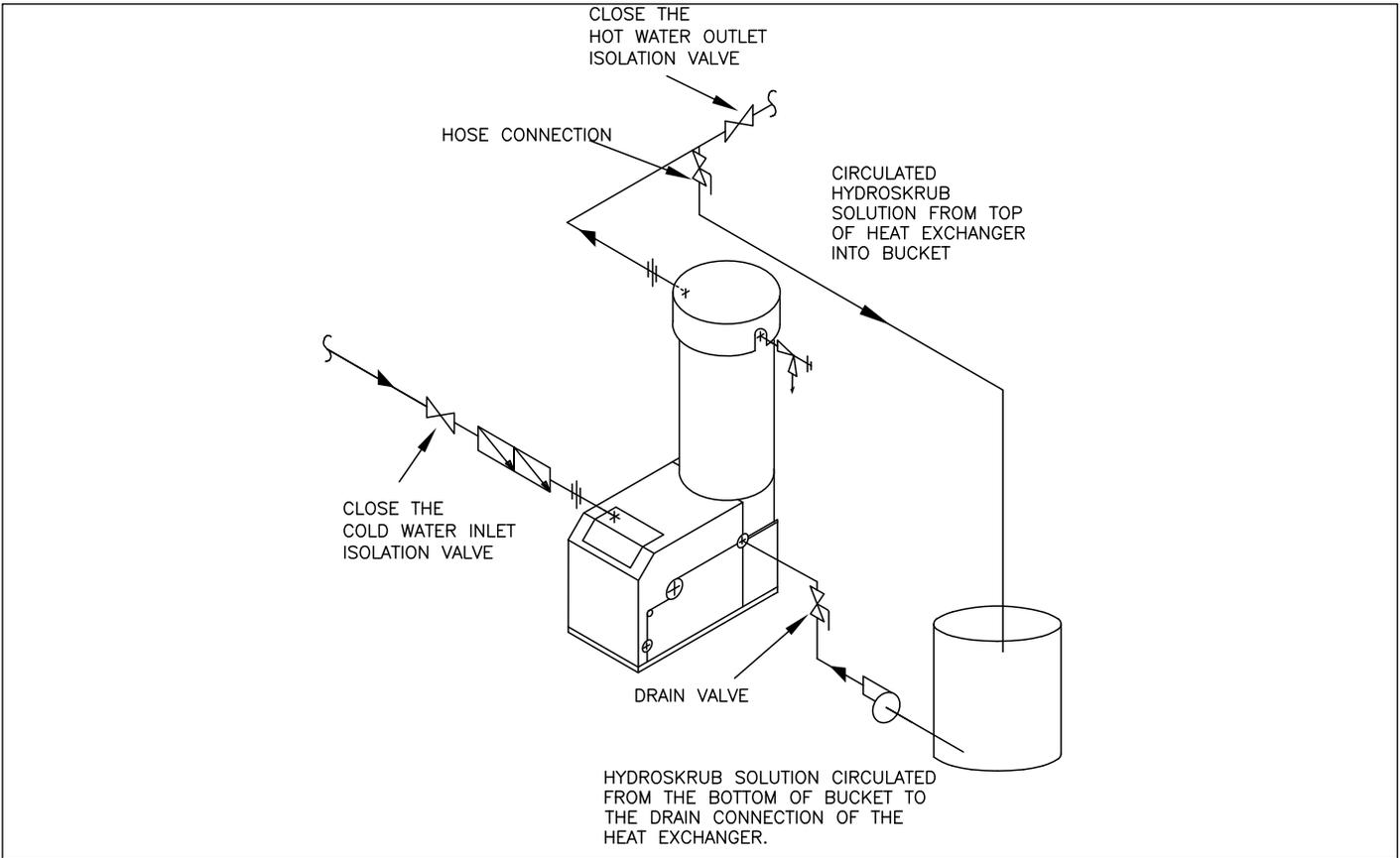


Figure 2: KC1000 Water Heater Recommended HydroForce Installation

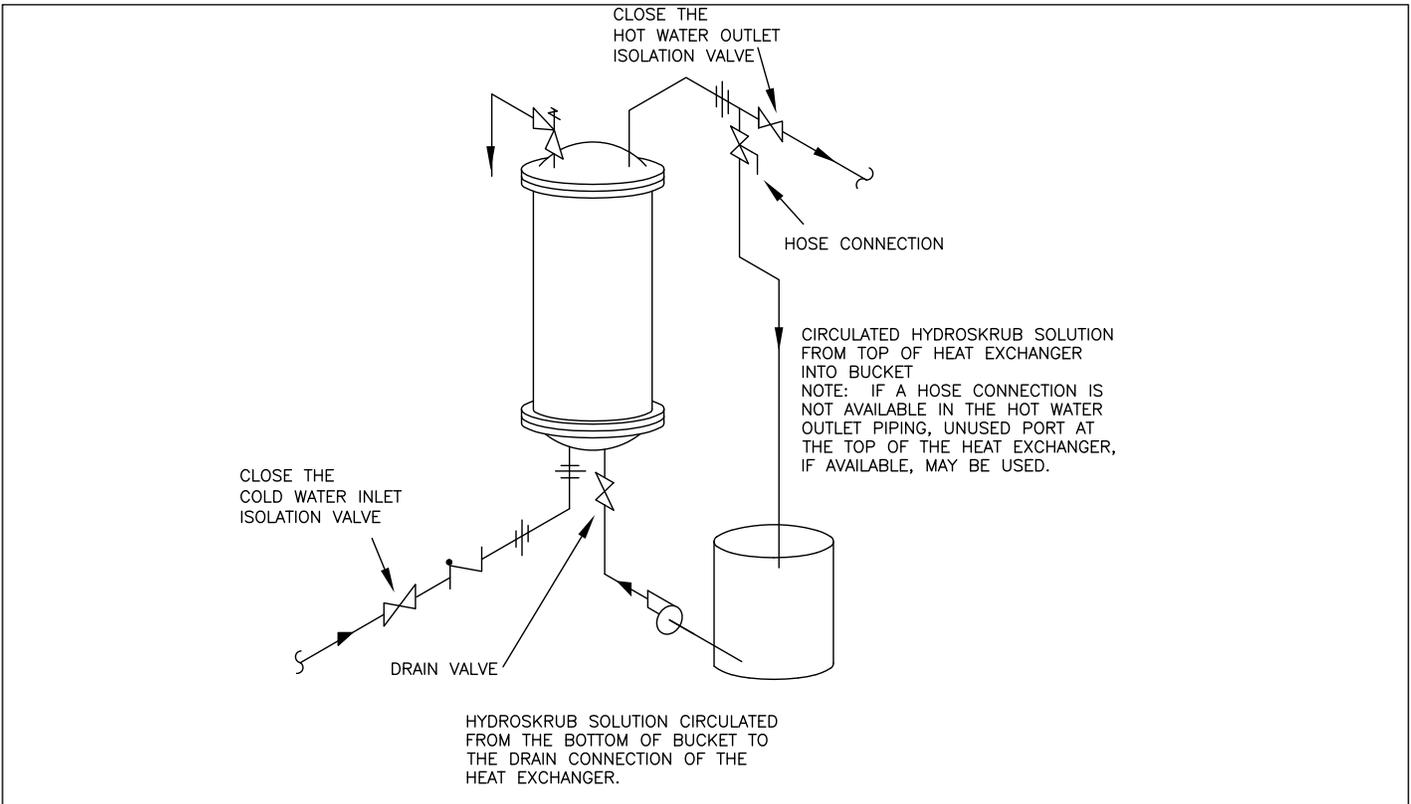


Figure 3: Helitherm Water Heater (A+, SW1B+, WaterWizard, E+) Recommended HydroForce Installation

Table 1: Heat Exchanger Volumes and HydroSkруб Recommendations

Model	Exchanger Volume (US Gallons)	Min. HydroSkруб (US Gallons)
KC1000 Water Heater	23	11.5
U-tube Double-wall DW24	9.6	4.8
U-tube Double-wall DW45	14.5	7.3
U-tube Double-wall DW68	20.2	10.1
SmartPlate SP23	1.7	0.9
SmartPlate SP33	2.4	1.2
SmartPlate SP45	3.4	1.7
SmartPlate SP69	5.2	2.6
SmartPlate SP150	11.3	5.7
SmartPlate SP23	2	1.0
SmartPlate SP32	2.8	1.4
SmartPlate SP42	3.7	1.9
SmartPlate SP61	5.5	2.8
SmartPlate SP113	10.2	5.1
SW1A+01	9.3	4.6
SW1A+02	8.9	4.4
SW1A+03	11.8	5.9
SW1A+04	14.8	7.4
SW1A+05	18.2	9.1
SW1B+03	13.1	6.6
SW1B+05	17.8	8.9
SW1B+07	22.5	11.3
SW1B+09	27.2	13.6
SW1B+11	31.9	16.0
SW1B+13	36.6	18.3
SW1B+15	41.3	20.7
WaterWizard B+03	13.1	6.6
WaterWizard B+04	18.3	9.2
WaterWizard B+05	17.8	8.9

Model	Exchanger Volume (US Gallons)	Min. HydroSkруб (US Gallons)
WaterWizard B+06	23	11.5
WaterWizard B+07	22.5	11.3
WaterWizard B+08	27.7	13.9
WaterWizard B+09	27.2	13.6
WaterWizard B+10	32.4	16.2
WaterWizard B+11	31.9	16.0
WaterWizard B+12	37.1	18.6
WaterWizard B+13	36.6	18.3
WaterWizard B+14	41.8	20.9
WaterWizard B+15	41.3	20.7
WW3E+03	20.9	10.4
WW3E+04	20.3	10.2
WW3E+05	27.5	13.8
WW3E+06	27.0	13.5
WW3E+07	34.2	17.1
WW3E+08	33.7	16.8
WW3E+09	40.9	20.5
WW3E+10	40.4	20.2
WW3E+11	47.6	23.8
WW3E+12	47.1	23.5
WW3E+13	54.3	27.1
WW3E+14	53.8	26.9
WW3E+15	61.0	30.5
WW3E+16	60.4	30.2
WW3E+17	67.6	33.8
WW3E+18	67.1	33.6
WW3E+19	74.3	37.2
WW3E+20	73.8	36.9