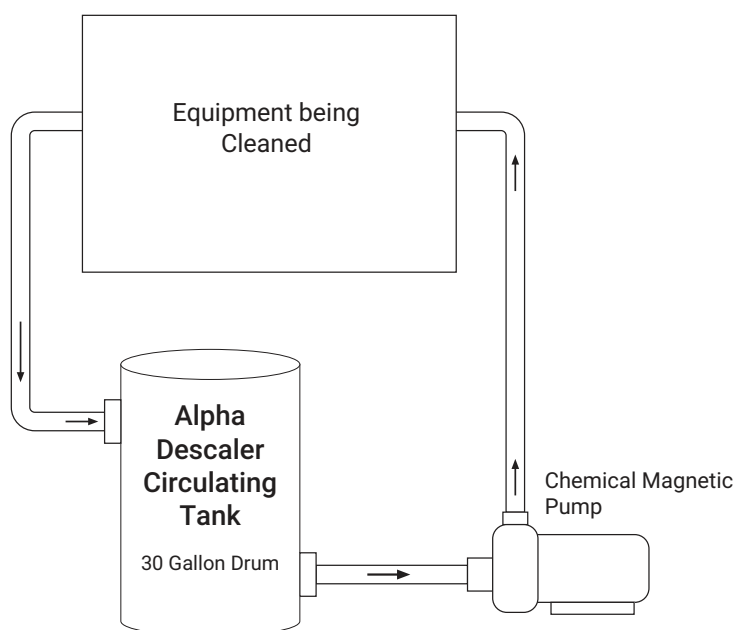


Condenser and Chiller

Alpha Descaler FG Application Instructions:

1. Bypass Condenser or Chiller from operation.
2. Remove the existing water in the Condenser or Chiller. This must be done to ensure proper results.
3. Disconnect the water in/out connections from the Condenser or Chiller.
4. Attached the necessary hoses to the water in/out connections on the Condenser or Chiller to a circulation pump and a circulating tank. (See drawing below for cleaning set up.) Refer to our chart for necessary circulation time/set time and the amount of Alpha Descaler FG to be used.
5. Circulate Alpha Descaler FG for 20 minutes, then turn the circulating pump off and let the Alpha Descaler FG sit for another 20-minutes. Repeat this process for the total amount of time listed on the chart.
6. After the first 20 minutes of circulating time, check the pH of the Alpha Descaler FG with a pH meter or pH strips. Before use, Alpha Descaler FG has a pH between 0 and 1. If the pH rises to around 3 or 3.5 after the first 20 minutes, add more Alpha Descaler FG to lower the pH to around 1. Continue this process through the duration of the circulating time shown on the chart below. When the pH of the Alpha Descaler FG stays the same, there should no more scale so the Condenser or Chiller should be cleaned.
7. Pump or move the remaining Alpha Descaler FG into another container. If the Alpha Descaler FG still has a pH around 1-3, use the Alpha Descaler FG for another cleaning.
8. After removing Alpha Descaler FG from the Condenser or Chiller, flush the Condenser or Chiller with water to remove all debris and remaining Alpha Descaler FG. If you want to completely neutralize the Condenser or Chiller, add sodium bicarbonate (baking soda) to the water while circulating. Add a ratio of ½ pound of sodium bicarbonate to 25 gallons of water.
9. Once you have neutralized the Condenser or Chiller, disconnect the hoses from the circulating pump and circulating tank. Re-connect the water inlet and outlet to the Condenser or Chiller.

Tonnage	Amount of Alpha Descaler (gallons)	Circulating Time (hours)
10	2	3
25	5	3
50	8	4
75	10	4
100	15	4
125	15	4
150	15	4
200	25	5
250	40	5
400	55	5
500	65	5
750	100	6
1000	125	7
2000	275	7
3000	400	8
4000	600	10
5000	900	10



***For ALPHA DESCALER FG EXTRA STRENGTH, use 50% of recommended amount.

Heat Exchanger

Heat exchangers in many manufacturing facilities are very crucial in everyday operations. Heat exchangers are designed to transfer heat in the form of kinetic energy from one liquid to another. And while transferring heat, the heat exchanger, over a period of time will collect lime, scale and rust on the waterside of the exchanger.

With Alpha Descaler FG, you do not have to dismantle or remove the unit from your operations. You may want to install a system, which will inject Alpha Descaler FG into your water supply on a regular basis for your cooling tower, chiller, or your closed loop water system. This procedure will eliminate downtime in your everyday operations while cleaning out your exchanger.

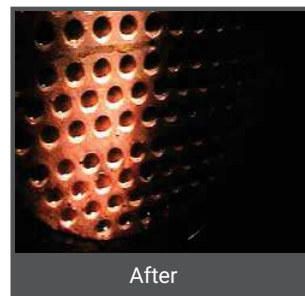
If you just intend to clean out the heat exchanger, you still do not have to dismantle or remove the exchanger from your operations.

Instructions for Alpha Descaler FG Cleaning

1. By-pass heat exchanger from operation.
2. Remove the existing water in the exchanger.
This MUST be done, to insure proper results.
3. Disconnect the water in/out connections from the exchanger.
4. Attach the necessary hoses to in/out connections on the exchanger to a circulating pump. Refer to chart below for necessary circulation of time and the amount of Alpha Descaler FG to be used.
5. Once the circulation has been completed, flush the exchanger with water to remove any insoluble material.



Before



After

Please refer to the Charts on the following pages for proper amount of Alpha Descaler FG to be used, and the circulation times.

Please Note: Calculations on amount and Circulation Times may vary for each system.



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QUANTITY & CIRCULATION – CALCULATION CHART

HEAT EXCHANGERS

4" through 8" Diameters

4" Diameter

4 Foot Length	1 Gal.	Circulate for 45 Min.
6 Foot Length	1 Gal.	Circulate for 45 Min.
8 Foot Length	1.5 Gal.	Circulate for 45 Min.
10 Foot Length	2 Gal.	Circulate for 1 Hr.
12 Foot Length	2 Gal.	Circulate for 1 Hr. 45 Min.
16 Foot Length	3 Gal.	Circulate for 1 Hr. 45 Min.
18 Foot Length	3 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	3 Gal.	Circulate for 1 Hr. 45 Min.
24 Foot Length	3.5 Gal.	Circulate for 1 Hr. 45 Min.
30 Foot Length	4 Gal.	Circulate for 2 Hr.
40 Foot Length	5 Gal.	Circulate for 2 Hr.

5" Diameter

4 Foot Length	1 Gal.	Circulate for 45 Min.
6 Foot Length	1.5 Gal.	Circulate for 45 Min.
8 Foot Length	1.5 Gal.	Circulate for 45 Min.
10 Foot Length	2.5 Gal.	Circulate for 1 Hr. 45 Min.
12 Foot Length	2.5 Gal.	Circulate for 1 Hr. 45 Min.
16 Foot Length	3.5 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	4.5 Gal.	Circulate for 1 Hr. 45 Min.
24 Foot Length	5 Gal.	Circulate for 1 Hr. 45 Min.
30 Foot Length	7 Gal.	Circulate for 1 Hr. 45 Min.
36 Foot Length	8 Gal.	Circulate for 1 Hr. 45 Min.
40 Foot Length	9 Gal.	Circulate for 2 Hr.

6" Diameter

4 Foot Length	1 Gal.	Circulate for 45 Min.
6 Foot Length	1 Gal.	Circulate for 45 Min.
8 Foot Length	2 Gal.	Circulate for 1 Hr. 45 Min.
10 Foot Length	3 Gal.	Circulate for 1 Hr. 45 Min.
12 Foot Length	4 Gal.	Circulate for 1 Hr. 45 Min.
16 Feet Length	5 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	6 Gal.	Circulate for 1 Hr. 45 Min.
24 Foot Length	7.5 Gal.	Circulate for 1 Hr. 45 Min.
30 Foot Length	11 Gal.	Circulate for 1 Hr. 45 Min.
36 Foot Length	14 Gal.	Circulate for 1 Hr. 45 Min.
40 Foot Length	15 Gal.	Circulate for 1 Hr. 45 Min.

8" Diameter

4 Foot Length	2 Gal.	Circulate for 45 Min.
5 Foot Length	2 Gal.	Circulate for 45 Min.
6 Foot Length	3 Gal.	Circulate for 45 Min.
8 Foot Length	4 Gal.	Circulate for 1 Hr. 45 Min.
10 Foot Length	6 Gal.	Circulate for 1 Hr. 45 Min.
16 Foot Length	8.5 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	11 Gal.	Circulate for 1 Hr. 45 Min.
24 Foot Length	15 Gal.	Circulate for 1 Hr. 45 Min.
30 Foot Length	18 Gal.	Circulate for 2 Hr. 45 Min.
36 Foot Length	23 Gal.	Circulate for 2 Hr. 45 Min.
40 Foot Length	25 Gal.	Circulate for 2 Hr. 45 Min.

***For ALPHA DESCALER FG EXTRA STRENGTH, use 50% of recommended amount.



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QUANTITY & CIRCULATION – CALCULATION CHART

HEAT EXCHANGERS

12" through 24" Diameters

12" Diameter

4 Foot Length	5 Gal.	Circulate for 1 Hr. 45 Min.
6 Foot Length	7 Gal.	Circulate for 1 Hr. 45 Min.
8 Foot Length	10 Gal.	Circulate for 1 Hr. 45 Min.
10 Foot Length	14 Gal.	Circulate for 1 Hr. 45 Min.
12 Foot Length	17 Gal.	Circulate for 1 Hr. 45 Min.
16 Foot Length	23 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	28 Gal.	Circulate for 2 Hr. 45 Min.
24 Foot Length	34 Gal.	Circulate for 3 Hr. 45 Min.
30 Foot Length	44 Gal.	Circulate for 3 Hr. 45 Min.
36 Foot Length	52 Gal.	Circulate for 3 Hr. 45 Min.
40 Foot Length	54 Gal.	Circulate for 3 Hr. 45 Min.

16" Diameter

5 Foot Length	11 Gal.	Circulate for 1 Hr. 45 Min.
6 Foot Length	16 Gal.	Circulate for 1 Hr. 45 Min.
8 Foot Length	19 Gal.	Circulate for 1 Hr. 45 Min.
10 Foot Length	23 Gal.	Circulate for 2 Hr. 45 Min.
12 Foot Length	29 Gal.	Circulate for 2 Hr. 45 Min.
16 Foot Length	41 Gal.	Circulate for 3 Hr. 45 Min.
20 Foot Length	52 Gal.	Circulate for 3 Hr. 45 Min.
24 Foot Length	60 Gal.	Circulate for 3 Hr. 45 Min.
30 Foot Length	80 Gal.	Circulate for 4 Hr. 45 Min.
36 Foot Length	95 Gal.	Circulate for 4 Hr. 45 Min.
40 Foot Length	110 Gal.	Circulate for 4 Hr. 45 Min.

20" Diameter

6 Foot Length	24 Gal.	Circulate for 2 Hr. 45 Min.
8 Foot Length	31 Gal.	Circulate for 2 Hr. 45 Min.
10 Foot Length	39 Gal.	Circulate for 3 Hr. 45 Min.
12 Foot Length	49 Gal.	Circulate for 3 Hr. 45 Min.
16 Foot Length	64 Gal.	Circulate for 3 Hr. 45 Min.
18 Feet Length	74 Gal.	Circulate for 4 Hr. 45 Min.
20 Foot Length	79 Gal.	Circulate for 4 Hr. 45 Min.
24 Foot Length	95 Gal.	Circulate for 4 Hr. 45 Min.
30 Foot Length	115 Gal.	Circulate for 4 Hr. 45 Min.
36 Foot Length	145 Gal.	Circulate for 4 Hr. 45 Min.
40 Foot Length	155 Gal.	Circulate for 4 Hr. 45 Min.

24" Diameter

5 Foot Length	27 Gal.	Circulate for 3 Hr. 45 Min.
6 Foot Length	34 Gal.	Circulate for 3 Hr. 45 Min.
8 Foot Length	49 Gal.	Circulate for 3 Hr. 45 Min.
10 Foot Length	55 Gal.	Circulate for 3 Hr. 45 Min.
12 Foot Length	65 Gal.	Circulate for 4 Hr. 45 Min.
16 Foot Length	90 Gal.	Circulate for 4 Hr. 45 Min.
20 Foot Length	115 Gal.	Circulate for 4 Hr. 45 Min.
24 Foot Length	135 Gal.	Circulate for 4 Hr. 45 Min.
30 Foot Length	175 Gal.	Circulate for 4 Hr. 45 Min.
36 Foot Length	215 Gal.	Circulate for 5 Hr. 45 Min.
40 Foot Length	235 Gal.	Circulate for 5 Hr. 45 Min.

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QUANTITY & CIRCULATION – CALCULATION CHART

HEAT EXCHANGERS

30" through 48" Diameters

30" Diameter

6 Foot Length	52 Gal.	Circulate for 1 Hr. 45 Min.
8 Foot Length	70 Gal.	Circulate for 1 Hr. 45 Min.
10 Foot Length	85 Gal.	Circulate for 1 Hr. 45 Min.
12 Foot Length	105 Gal.	Circulate for 1 Hr. 45 Min.
16 Foot Length	145 Gal.	Circulate for 1 Hr. 45 Min.
18 Foot Length	160 Gal.	Circulate for 1 Hr. 45 Min.
20 Foot Length	175 Gal.	Circulate for 2 Hr. 45 Min.
24 Foot Length	215 Gal.	Circulate for 3 Hr. 45 Min.
30 Foot Length	275 Gal.	Circulate for 3 Hr. 45 Min.
36 Foot Length	325 Gal.	Circulate for 3 Hr. 45 Min.
40 Foot Length	355 Gal.	Circulate for 3 Hr. 45 Min.

36" Diameter

6 Foot Length	75 Gal.	Circulate for 4 Hr. 45 Min.
8 Foot Length	105 Gal.	Circulate for 4 Hr. 45 Min.
10 Foot Length	125 Gal.	Circulate for 4 Hr. 45 Min.
12 Foot Length	155 Gal.	Circulate for 4 Hr. 45 Min.
16 Foot Length	215 Gal.	Circulate for 5 Hr. 45 Min.
18 Foot Length	250 Gal.	Circulate for 5 Hr. 45 Min.
20 Foot Length	265 Gal.	Circulate for 5 Hr. 45 Min.
24 Foot Length	325 Gal.	Circulate for 6 Hr. 45 Min.
30 Foot Length	395 Gal.	Circulate for 6 Hr. 45 Min.
36 Foot Length	480 Gal.	Circulate for 6 Hr. 45 Min.
40 Foot Length	530 Gal.	Circulate for 6 Hr. 45 Min.

40" Diameter

6 Foot Length	90 Gal.	Circulate for 4 Hr. 45 Min.
8 Foot Length	115 Gal.	Circulate for 4 Hr. 45 Min.
10 Foot Length	140 Gal.	Circulate for 4 Hr. 45 Min.
12 Foot Length	170 Gal.	Circulate for 5 Hr. 45 Min.
16 Foot Length	230 Gal.	Circulate for 5 Hr. 45 Min.
18 Feet Length	270 Gal.	Circulate for 6 Hr. 45 Min.
20 Foot Length	300 Gal.	Circulate for 6 Hr. 45 Min.
24 Foot Length	350 Gal.	Circulate for 6 Hr. 45 Min.
30 Foot Length	450 Gal.	Circulate for 6 Hr. 45 Min.
36 Foot Length	550 Gal.	Circulate for 7 Hr. 45 Min.
40 Foot Length	630 Gal.	Circulate for 7 Hr. 45 Min.

48" Diameter

4 Foot Length	90 Gal.	Circulate for 4 Hr. 45 Min.
6 Foot Length	125 Gal.	Circulate for 4 Hr. 45 Min.
8 Foot Length	165 Gal.	Circulate for 4 Hr. 45 Min.
10 Foot Length	195 Gal.	Circulate for 5 Hr. 45 Min.
16 Foot Length	330 Gal.	Circulate for 6 Hr. 45 Min.
18 Foot Length	390 Gal.	Circulate for 6 Hr. 45 Min.
20 Foot Length	450 Gal.	Circulate for 6 Hr. 45 Min.
24 Foot Length	525 Gal.	Circulate for 7 Hr. 45 Min.
30 Foot Length	650 Gal.	Circulate for 7 Hr. 45 Min.
36 Foot Length	775 Gal.	Circulate for 7 Hr. 45 Min.
40 Foot Length	875 Gal.	Circulate for 7 Hr. 45 Min.

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