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# Operation and Installation Manual

## CCH® Acid Plus System

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Model CCH-1AP



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# 1 Safety Precautions

⚠ Danger, ⚠ Warning, ⚠ Caution, and Note statements are used throughout this manual to emphasize important safety information. The statements are defined below.

## 1.1 Safety Conventions

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 **Danger:** Indicates a hazardous situation which, if not avoided, will result in death or severe injury.

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 **Warning:** Indicates a potentially hazardous situation which, if not avoided, can result in personal injury.

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 **Caution:** Indicates a potentially hazardous situation which, if not avoided, can result in minor personal injury or equipment damage.

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**Note:** Information that may assist in completing a task correctly or for maintaining the machine in good operating condition.

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## 1.2 Safety Statements for the CCH® Acid Plus

- 
-  **Danger:** Sodium bisulfate causes severe skin burns and eye damage. Please see the Safety Data Sheet for additional information and precautions regarding the proper handling of CCH® Dry Acid Plus. If any part of this profile is unclear to you, please stop immediately and contact Innovative Water Care at (800) 478-5727.
- 
-  **Danger:** This system contains liquid under pressure and sodium bisulfate solution can be discharged unexpectedly. Operate and service all components and attached piping that contains liquid cautiously until you are certain that the system has been depressurized and drained. Failure to do so may result in serious injury.
- 
-  **Danger:** Use suitable personal protective equipment (PPE) at all times to avoid physical contact with sodium bisulfate liquid or vapor. Failure to do so may result in serious injury. See the Safety Data Sheet for additional information and precautions regarding the proper handling of CCH® Dry Acid Plus.
- 
-  **Warning:** For your protection, carefully and completely read the information provided in this manual before attempting to assemble, install, operate, or maintain this product. Retain these instructions for future reference. Failure to follow the instructions or information in this manual may result in injury and damage to the product and may affect warranty coverage.
- 
-  **Warning:** Clean up, without delay, any leakage or spillage of CCH® Dry Acid Plus. See the Safety Data Sheet for additional information and precautions regarding the proper disposal of CCH® Dry Acid Plus. Failure to do so may result in serious injury.
- 
-  **Warning:** All wiring connections, fusing, grounding, inspection, and maintenance of wiring must be performed by a licensed electrician in accordance with the National Electric Code (NEC), Occupational Safety and Health Act (OSHA) in the United States, and all local electrical codes. Failure to properly install and wire this product can result in property damage, serious injury, or death, and may affect warranty coverage.
- 
-  **Warning:** Always operate system with electrical component enclosures in place. Failure to do so may result in injury.
- 
-  **Warning:** Always operate system components with safety guards in place. Failure to do so may result in injury.
- 
-  **Warning:** Observe and follow all plant safety procedures. Failure to do so may result in injury.
- 
-  **Caution:** Do not paint over or remove unit nameplates, labels, or tags.
- 
-  **Caution:** Use of any dry acid or chemicals other than the CCH® Dry Acid Plus designed for use with this feeder shall void this warranty and NSF certification.
-

# 2 Introduction

The CCH® Acid Plus feeder creates a consistent solution of sodium bisulfate acid used for pH reduction.

## 2.1 Overview of Operation

The feeder operates as follows:

1. CCH® Dry Acid Plus is loaded into the hopper suspended over the solution reservoir.
2. The external solenoid valve power supply is plugged into a chemical controller pH dosing output.
3. When the chemical controller calls for a pH correction, the feed solenoid valve opens allowing Water from the pool return to enter the inlet water manifold at the proper supply flow rate.
4. Water sprays the bottom of the basket through three 90° full cone nozzles.
5. CCH® Dry Acid Plus dissolves and creates a 93% sodium bisulfate solution. 10 lbs of sodium bisulfate is equivalent to 1 gallon of muriatic acid.
6. The sodium bisulfate solution fills the reservoir lifting the float connected to the discharge valve until the valve opens.
7. With the discharge valve and outlet tubing connected to a venturi, the vacuum generated by the venturi suction drains the reservoir tank of the acid solution, sending the solution back into the pool return.

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**Note:** If using the same booster pump loop as the CCH® Elite feeder as shown in the schematic, set booster pump to Always On by setting dip switch 4 to OFF in the control box.

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**Note:** If not using a CCH® Elite feeder as the primary sanitizer, a dedicated booster pump and venturi is required for operation of the CCH® Acid Plus feeder.

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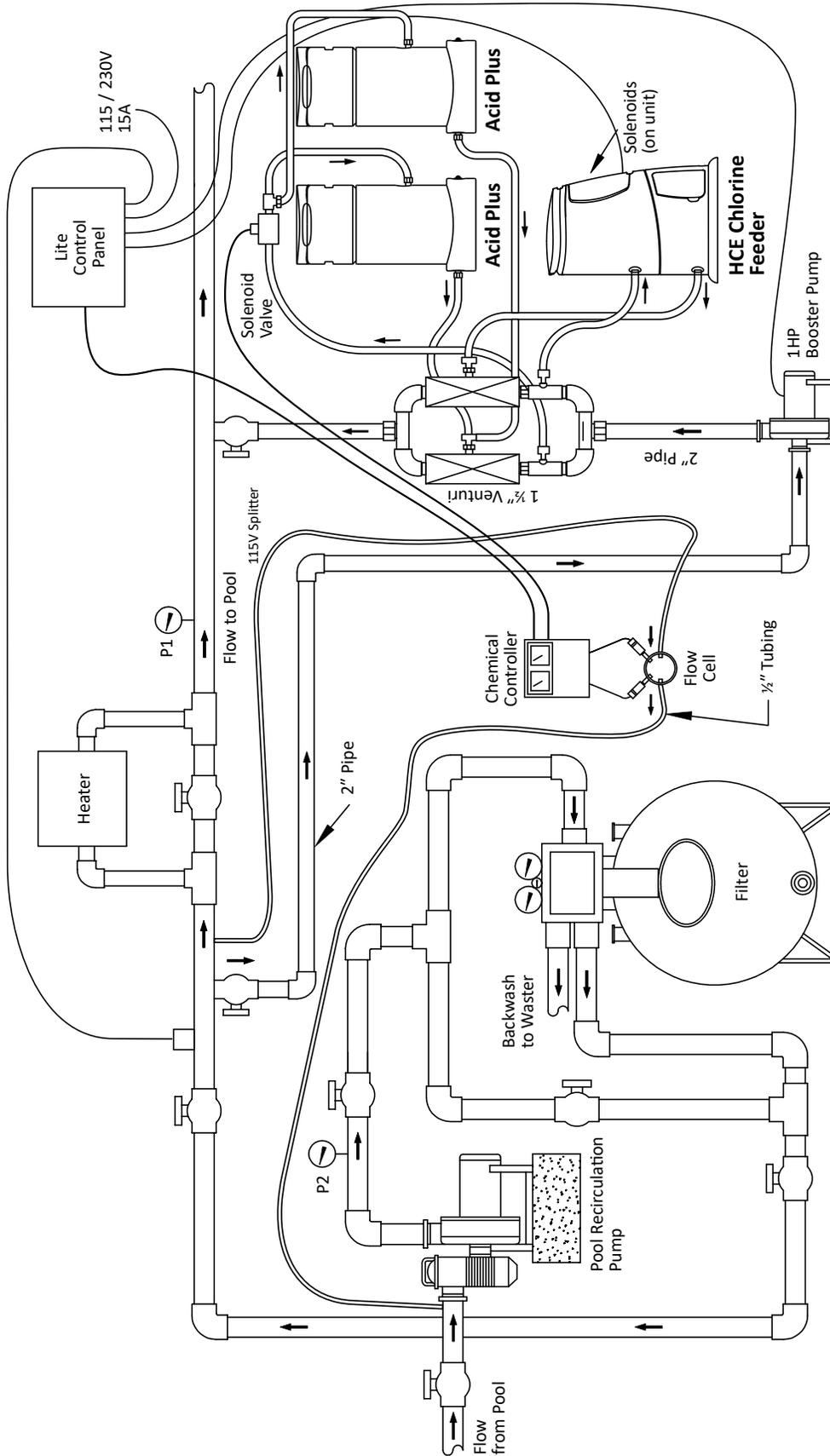
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**Note:** If not using the CCH® Elite feeder control box for booster pump operation, other means of interlocking the booster pump to the pool pump is required to protect the booster pump and prevent accidental dosing in a no flow condition.

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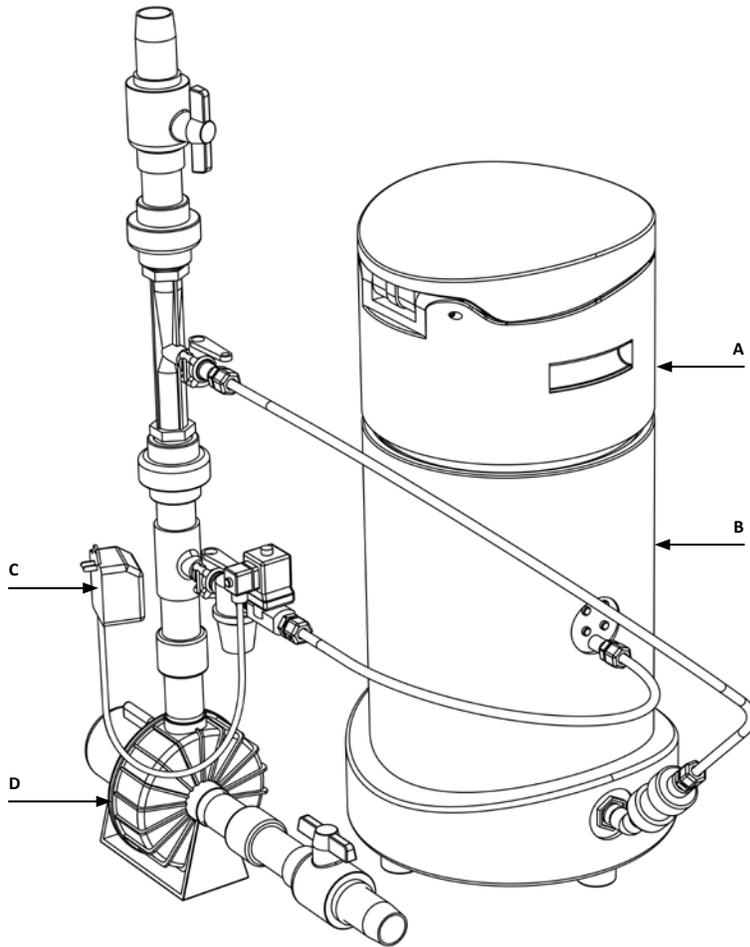


Figure 2. CCH® Acid Plus DUO installation



# 3 CCH<sup>®</sup> Acid Plus Feeder Overview

**Figure 3.** CCH<sup>®</sup> Acid Plus System Overview



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**Note:** This image is a general overview of the major components of the system. Refer to Section 5.1 and Section 10.2 for part details.

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## 3.1 Components List

The CCH<sup>®</sup> Acid Plus product includes these components:

- A. Hopper, includes:
  - A1 Chemical tank
  - A2 Meshed grid
- B. Base, includes:
  - B1 Spray manifold
  - B2 Emergency shutoff valve assembly
  - B3 Discharge valve assembly
  - B4 Solution mixing manifold
- C. ORP kit with solenoid valve and power supply
- D. Booster pump and Venturi, installation kit

# 4 Pre-installation Instructions

## 4.1 Prepare the Site

Before installing equipment, ensure that:

1. The site has all electrical connections installed. All electrical lines should be secured to meet site safety procedures and to prevent tripping over electrical lines.

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 **Danger:** All wiring connections, fusing, grounding, inspection, and maintenance of wiring must be performed by a licensed electrician in accordance with the National Electric Code (NEC), Occupational Safety and Health Act (OSHA) in the United States, and all local electrical codes. Failure to properly install and wire this product can result in property damage, injury, or death, and may affect warranty coverage.

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2. Site meets criteria noted in 4.1.1 Site Requirements.

### 4.1.1 Site Requirements

- The feeder must fit in the selected room with enough clearance for maneuvering and servicing the equipment.
  - Recommended clearance for feeder installation is 48" L x 48" W x 76" H [121.9 cm x 121.9 cm x 152.4 cm]
  - Minimum clearance for feeder installation is 29 L x 26.5" W x 45.9" H [73.6 cm x 67.3 cm x 116.6 cm].
- The room must have proper ventilation.
- Required electrical service is as follows:
  - 100 - 240V AC / 15 – 20 Amps dedicated outlet
  - 60 Hz Single phase only (for installing the 1HP booster pump without a CCH® Elite feeder)
  - 50 Hz systems require locally sourced booster pump (see booster pump section for more info)
- Determine the inlet and outlet location of the booster pump and venturi loop.
  - It is preferable to install this loop across the heater bypass valve to maximize the pressure differential of the system to enhance performance.
  - The booster pump suction should always be downstream of the pool filter(s) to ensure the use of clean filtered water to protect the solenoid valves. Refer to the process flow diagram in section 2.2 for proper location of piping connections
  - The booster pump and venturi should be located to minimize the use of 90° elbows on the venturi outlet
- The following cable lengths need to be considered for placement of the feeder:
  - Solenoid valve power supply cable is 10' [3m]
  - The feeder will need to be within 10' [3m] of the chemical controller.

## 4.2 Gather Equipment for Feeder Installation

### 4.2.1 CCH® Acid Plus Components

See the Components List on page 9.

### 4.2.2 Essential Equipment Supplied by Others

- 1 ½" Sch 40 pipe.
- 1 ½" ball valves (x2)
- 1 ½" Sch 40 elbows, 45° & 90°
- ½" [12.7 mm] flexible tubing
- PVC Primer and glue
- Saddle clamps for connection to 1 ½" PVC pipe from pool return (optional)
- Plumbers tape

### 4.2.3 COTS Tools

- Drill
- 1 ¾" [44.45 mm] hole saw and 1 ½" NPT tap (optional)
- 45/64" [17 mm] Drill and ½" NPT Tap
- Saddle clamps (optional)
- Pipe wrenches or gas pliers
- Tubing cutters
- Saw to cut PVC pipe

### 4.2.4 PPE

- Rubber gloves
- Safety glasses
- Apron

## 4.3 Pre-Installation Checklist

**Table 1. Pre-installation Checklist**

Item No	Check	Completed?
1	Is a licensed electrician available to perform necessary electrical wiring of the booster pump?	
2	Does the site meet all criteria noted in Site Requirements on page 10	
3	Have inlet and outlet locations on the pool return post filter been identified?	
4	Are all CCH® Acid Plus components on hand?	
5	Is all essential equipment supplied by others on hand?	
6	Are all COTS tools and other equipment on hand?	
7	Is all PPE on hand?	

# 5 Installation Instructions

## 5.1 Install Booster Pump- Venturi Loop

Downstream of your pool filter(s), connect the booster pump suction and venturi outlet 1 1/2" piping: See Figure 4

Figure 4. 1 1/2" booster pump and venturi assembly

**Danger:** Shut off the pool pump and isolate the pool return piping location used for the installation to prevent excessive water leakage.

**Danger:** If installing with a chlorine feeder OTHER than the CCH® Elite, electrically interlocking the booster pump with the pool pump is recommended to protect the pump from running dry in a no flow condition.

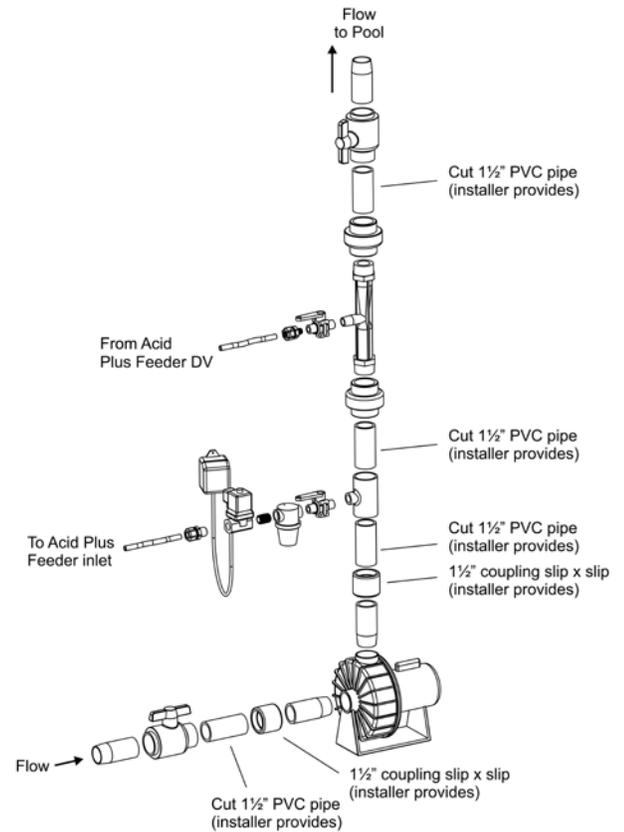
**Note:** If installing with a chlorine feeder OTHER than the CCH® Elite, connect the booster pump directly to the facility 115/230 VAC power source.

**Note:** Refer to the process flow diagram in section 2.2 for proper location of system piping connections

**Note:** If installing WITH a CCH® Elite chlorine feeder, use 1/2" threaded tees to split the the flow to the feeder inlet and venturi suction from the feeder discharge

**Note:** If installing WITH a CCH® Elite chlorine feeder, refer to section 5 of the CCH® Elite Operation and Installation manual for booster pump, venturi, and flow switch installation instructions

**Note:** Saddle clamps or tee's can be used as an alternative for a cleaner installation.



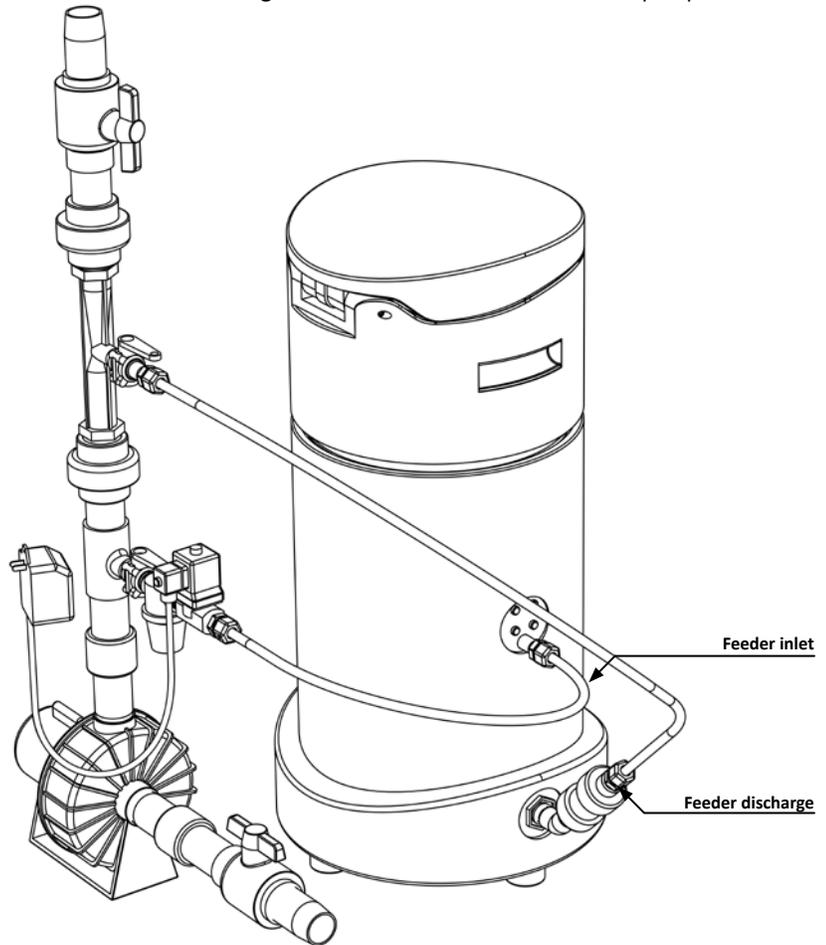
1. Drill and tap two 1 1/2" NPT holes that will be used for the booster pump inlet and venturi outlet, respectively.
2. Since not all pipes run full, for horizontal pipe, drill the holes on the side or bottom.
3. Cut in half the 12" x 1 1/2" PVC threaded nipple provided in the installation kit.
4. Apply plumbers' tape to the threads of the two nipples and thread the nipples into the 1 1/2" tapped holes.
5. Add silicon seal bead around the thread connection to help make a waterproof seal.
6. Take the 1 1/2" ball valves and glue them onto the 1 1/2" nipples. These are the isolation valves to the inlet and outlet of the booster pump and venturi.
7. Glue the 2" x 1 1/2" reducer bushings to the pump union tailpieces and connect to the booster pump suction and discharge.
8. Apply plumbers tape on the venturi threads and thread the 1 1/2" unions to both ends of the venturi.
9. Complete the 1 1/2" piping run from the inlet nipple to the booster pump suction (image)
10. Connect the discharge of the booster pump with the 1 1/2" to 1/2" reducer bushing and the 1 1/2" venturi ensuring the venturi is oriented in the direction of flow.
11. Complete the 1 1/2" piping run from the outlet of the venturi to the outlet nipple on the pool return using as few 90° elbows as practicable. The use of 45° elbows in place of 90° elbows are preferred to minimize backpressure on the venturi outlet.

## 5.2 Feeder Setup – Discharge Valve (DV) Assembly to Venturi Suction

To connect the feeder discharge to the venturi suction, refer to Figure 4 and Figure 5.

1. Complete the DV assembly on the exterior base of the feeder.
  - a. Install the 45° threaded elbow on the discharge valve threads exposed on the exterior of the feeder base. Ensure that the elbow is pointed up.
  - b. Install the threaded nipple, union check valve, and tubing connector to complete the assembly.
2. Complete assembly on the venturi suction.
  - a. If installing with the CCH® Elite feeder, install the ½" threaded Tee on the venturi suction, otherwise skip this step and go to step 2b.
  - b. Install the ½" ball valve and tubing connector.
3. Estimate how much tubing is needed to make the connection between the feeder and venturi and cut the appropriate tubing length using tubing cutters.
4. Connect the tubing to the tubing connector on the venturi suction.

**Figure 5.** Feeder connections to booster pump and venturi



## 5.3 Feeder Setup – Feeder inlet line from booster pump discharge

To connect the feeder discharge to the booster pump discharge, refer to Figure 4 and Figure 5.

1. Complete assembly on the booster pump discharge prior to the venturi
  - a. If installing with the CCH® Elite feeder, install the ½" nipple and threaded Tee at the discharge of the booster pump, otherwise skip this step and go to step 1b
  - b. Install the ½" ball valve, strainer, solenoid valve and tubing connector to complete the assembly
2. Complete the inlet connection of the feeder by installing the tubing connector
3. Estimate how much tubing is needed to make the connection between the feeder and venturi and cut the appropriate tubing length using tubing cutters
4. Connect the feeder inlet to the booster pump discharge.

## 5.4 Feeder Setup if pairing with a CCH® Elite Chlorine Feeder

Refer to the CCH® Elite operation and installation manual for chlorine feeder installation instructions

**Note:** When using the same booster pump as the Elite feeder as shown in the schematic in figure 1, the booster pump should be wired through the CCH® Elite control box to benefit from the safety features of the flow switch. Refer to section 5.6 and 5.7 of the Elite manual for instructions.

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**Note:** When using the same booster pump as the Elite feeder, set the booster pump to Always On by setting dip switch 4 to OFF in the control box. This will allow the booster pump to provide constant flow to both feeders, except for when there is a No Flow condition in the pool recirculation piping.

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**Note:** With an average of 30 gpm through the 1 ½" pipe and 3 gpm at the suction, the motive flow through the venturi provides roughly a 10 to 1 dilution ratio of water to chemical solution injected at the venturi suction. Additional dilution occurs when the solution is introduced at the main pool piping.

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**Note:** For any custom installation inquiries, such as using a different booster pump, contact your sales rep for support.

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1. Refer to the schematic in Figure 1 and booster pump and venturi assembly (Figure 4 and Figure 5) for guidance
2. If installing the CCH® Acid Plus dry acid feeder with CCH® Elite chlorine feeders, a dual venturi configuration is required for optimal performance. Refer to Figure 1 and Figure 2.

## 5.5 Wire the Booster Pump to facility power (Generic Chlorine Feeder Use)

Using a certified electrician, connect the booster pump to facility power using 12 AWG or bigger wire.

**Warning:** Risk of dangerous or fatal electric shock. Be sure that power to the motor circuit is off before working on wiring, wiring connections, or the motor. Re-install the motor end cover and all other wiring covers before turning on the power.

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**Note:** Be sure no other lights or equipment are on the same circuit as the booster pump.

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**Note:** Use Ground Fault Circuit Interrupter (GFCI) as a master on-off switch.

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**Note:** If installing WITH a CCH® Elite chlorine feeder, wire the booster pump directly to the feeder control box to benefit from safety and energy saving features.

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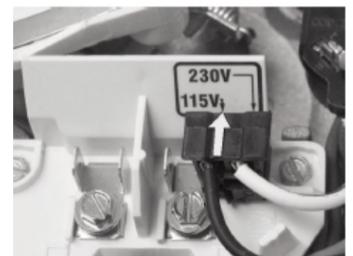
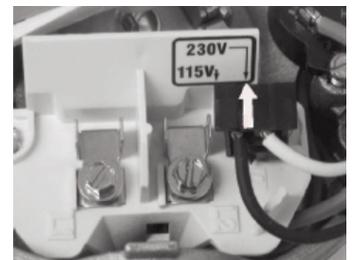
1. Remove the booster pump motor end cover to expose the pump's dual-voltage selector, Figure 6.
2. If you have 230 V motor supply voltage, confirm that the plug is set for 230 V. The arrow on the plug will point to the 230 V position, which is the default position of the pump (the plug only connects with one prong in this position).
3. If you have 115 V supply, pull the plug straight up and place it on the two brass prongs so that the arrow points to the 115 V position.
4. Replace the booster pump end cover to complete the booster pump wiring.

## 5.6 Prime the System

Allow pool water to enter the 1 ½" and ½" piping and tubing to confirm overall water tightness

1. Open the 1 ½" inlet ball valve at the booster pump suction and allow water to enter checking for leaks
2. Slowly crack open the booster pump discharge union allowing water to flow out confirming that the booster pump is fully primed.
3. Reconnect and tighten the discharge union.
4. Open the 1 ½" outlet ball valve fully priming the entire booster pump / venturi loop.
5. Open the ½" gray inlet and outlet feeder ball valves allowing water to reach the feeder(s).
6. Check for leaks at the booster pump and venturi loop, feeder(s) and flow. switch, if installed, and redo any leaking connections.

Figure 6. Dual-voltage selector



# 6 Post-Installation Instructions

## 6.1 Post-Installation Checklist

Before first-time startup of the feeder, check:

**Table 2. Post-Installation Checklist**

Item No	Check	Completed?
1.	Is there any residual debris (plastic shavings, screws, and so on) inside the solution tank?	
2.	Has the booster pump been fully primed?	
3.	Are all electrical lines secure and not a tripping hazard?	
4.	Are all exposed electrical and instrument lines protected and do they meet field conditions?	
5.	Does the booster pump motor plug line up to the correct voltage supply?	
6.	If using with a CCH® Elite feeder, is the control box cover closed and screws securely tightened?	
7.	If the booster pump is wired to a CCH® Elite control box, is dip switch 4 set to the off position for Always On operation?	
8.	Are all fittings and unions tightened to prevent leaks?	
9.	Are flow directional arrows pointed in the correct direction of flow on the venturi, solenoid valves, and check valve?	

## 6.2 System Startup

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**Note:** Before starting up the equipment, ensure that the Post-Installation checklist has been completed.

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### 6.2.1 System Power Up

After completing the post-installation checklist:

1. Once the system is fully primed, ensure the 1 ½" booster pump and venturi inlet and outlet ball valves are in the fully open position.
2. Ensure the ½" feeder inlet and outlet ball valves coming from the booster pump and venturi are in the fully open position
3. Energize and power on the booster pump

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**Note:** Refer to the booster pump user manual for troubleshooting any issues

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4. With the solenoid valve plugged into the chemical controller pH control output, test the solenoid and feeder operation

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**Note:** Refer to the chemical controller user manual to manually call for pH down

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5. Check that the solenoid valve energizes. There should be an audible click that occurs when the valve receives power and opens.
6. With the solenoid valve energized, open the hopper lid, ensure that water is coming out of the three blue spray nozzles, and the nozzles are facing up
7. With water continuing to come out of the spray nozzles, ensure that the DV and feeder discharge is operating correctly, and water is pulled out of the base by the venturi. This can be visually confirmed if using the clear ½" discharge tubing
8. If the feeder, booster pump, and venturi appear to be operating correctly, stop the chemical controller pH control output,
9. Shut the ½" feeder inlet and outlet ball valves coming from the booster pump and venturi to isolate the feeder and prepare the feeder for operation

### 6.2.2 Feeder Preparation

1. Open hopper lid.
2. Place meshed grid into the hopper.
3. Put on the appropriate PPE: long sleeved clothing, rubber gloves, apron, dust mask, and safety glasses.

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 **Danger:** Use suitable personal protective equipment (PPE) at all times to avoid physical contact with sodium bisulfate. Failure to do so may result in death or serious injury. See the Safety Data Sheet for additional information and precautions regarding the proper handling of CCH® Dry Acid Plus.

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 **Danger:** Fire or explosion could result from contamination or use of any other chemical compound! When filling the hopper with sodium bisulfate acid, use a scoop dedicated for this purpose.

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4. Use a dedicated scooper to add CCH® Dry Acid Plus into the hopper on top of the meshed grid.
5. Plug the solenoid valve power supply into the pH control output of the chemical controller
6. Close hopper lid.

# 7 Operation Instructions

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**Warning:** The use of CCH® Dry Acid Plus dry sodium bisulfate reduces the pH in a pool. Ensure the chemical controller's pH control output is configured for pH down control. The use of this feeder and chemical with a pH up control configuration will result in overdosing acid and lowering the pH to unsafe levels.

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**Caution:** Use of any other chemicals other than the CCH® Dry Acid Plus for use with this feeder shall void this warranty.

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**Note:** When using the same booster pump and venturi as the Elite feeder, set the booster pump to Always On by setting dip switch 4 to OFF in the control box. This will allow the booster pump to provide constant flow to both feeders, except for when there is a No Flow condition in the pool recirculation piping.

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To operate the CCH® Acid Plus Feeder:

1. Open the ½" feeder inlet and outlet ball valves coming from the booster pump and venturi
2. Ensure the feed solenoid valve is plugged into the chemical controller pH control output for pH down
3. Ensure there is CCH® Dry Acid Plus in the hopper on the meshed grid
4. Ensure the booster pump is powered on
  - a. Ensure the booster pump is powered on at the facility breaker if using with a chlorine feeder OTHER than a CCH® Elite.
  - b. Ensure the CCH® Elite control box is powered on and in ORP mode if the booster pump is wired directly into the control box.
5. Set the desired pH setpoint on the chemical controller and follow the chemical controller user manual for additional instructions on pH control automation.
6. When a pH reduction signal is sent by the chemical controller, the feed solenoid valve will energize and open, and a feed cycle will start creating acid solution for injection into the pool
7. Once pH reduction demand terminates, the solenoid valve will de-energize and shut, and the feeder will stop creating acid solution until the next pH reduction demand is sent.
8. Refer to 6.2.2 Feeder Preparation to refill hopper with chemical as necessary

# 8 Preventative Maintenance

## 8.1 Preventative Maintenance Schedule

Complete each of the following tasks during the first week of each month.

**Table 3. Monthly Maintenance**

Action Needed	Maintenance Process	Time to Complete
Change/clean basket	See Section on page 19.	
Inspect inlet and outlet plumbing fittings	<p>Verify that there are no leaks at any of the inlet and outlet ½” feeder fittings and 1 ½” booster pump and venturi piping and fittings, including the booster pump itself.</p> <ol style="list-style-type: none"> <li>1. Close all isolation ball valves and re-plumb / replace any leaking piping and fittings.</li> <li>2. If leaking is observed at the pump motor, the pump shaft seal and impeller will have to be replaced. Refer to the booster pump manual troubleshooting guide and repair parts list for additional information.</li> </ol>	2 min
Inspect booster pump	<ol style="list-style-type: none"> <li>1. Visually check for leaks on and around the pump, including the suction and discharge piping and fittings.</li> <li>2. Close inlet and outlet 1 ½” ball valves and tighten or replace any leaking fittings.</li> <li>3. If leaking observed at the pump motor, the pump shaft seal and impeller is likely burned.</li> <li>4. Refer to the booster pump manual troubleshooting guide and repair parts list for additional information.</li> </ol>	
Inspect inlet line strainer assembly	<ol style="list-style-type: none"> <li>1. With pressure in the line, visually inspect the strainer basket for leaks. Replace entire basket assembly if leaking.</li> <li>2. Close inlet ball valve</li> <li>3. Remove strainer basket and visually inspect for cracks and debris.</li> <li>4. Remove strainer screen and wash it out prior to replacing it back into the basket.</li> <li>5. If screen appears damaged or has a hole in it, replace with a new screen.</li> <li>6. Re-install the strainer basket back into the strainer body</li> </ol>	10 - 15 min
Inspect discharge check valve	<ol style="list-style-type: none"> <li>1. Close the outlet ball valve</li> <li>2. Open the lower left and right base covers and unscrew the check valve unions to remove the check valve body</li> <li>3. Disassemble the check valve and inspect for debris. Clean if necessary.</li> <li>4. Visually check the seal for corrosion. If seal is corroded, replace check valve</li> <li>5. Re-assemble the check valve body ensuring ensuring the seal is on the side of the ball.</li> <li>6. Replace the check valve body back onto the unions, ensure arrow points away from the feeder.</li> </ol>	10 min
Inspect reservoir tank	<p>Visually inspect solution reservoir and ensure that there is no debris, i.e., dirt or contamination, on the high-level switch or the discharge valve (DV) assembly including the DV float, and arm.</p> <ul style="list-style-type: none"> <li>▪ Debris on the level switch will prevent positive notification of a high-level event. Verify level switch operation by lifting the switch and confirming the alert indicator light turns on.</li> <li>▪ Debris on the DV float or arm can interfere with feeder discharge operation. Remove debris as needed.</li> </ul>	5 min

Complete the following tasks during the first week of January and the first week of July.

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**Note:** Maintenance that prevents the discharge line from clogging is critical to feeder operation.

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**Table 4. Semiannual Maintenance**

Action Needed	Maintenance Process	Time to Complete
Inspect Venturi (If using with a CCH® Elite Feeder)	<ol style="list-style-type: none"> <li>1. Close inlet and outlet 1 ½” ball valves to the booster pump suction and venturi outlet.</li> <li>2. Close inlet and outlet ½” ball valves to the feeder.</li> <li>3. Disconnect feeder discharge tubing from the venturi.</li> <li>4. Remove the venturi via the 1 ½” unions and visually inspect and verify it is not clogged with scale build up.</li> <li>5. If scale buildup is found, refer to cleaning instructions in the CCH® Elite Manual, Section 8.2.</li> </ol>	2 - 5 min
Inspect solenoid valve	During feed or wash cycle, if solenoid valves are hot to the touch, consider rebuilding or replacing the valve. If solenoid makes a rattling noise when energized, consider replacing the valve.	2 min

## 8.2 Cleaning Procedures

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**Note:** CCH® Dry Acid Plus chemical is 100% dissolvable and as such, no residue or scaling develops as part of the dissolution process. This allows the feeder to run clean during normal operation with no major offline cleaning requirements.

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**Note:** Inspect the feeder regularly in accordance with the preventative maintenance schedule in section 7.1. If external debris or contamination is found within the feeder or feeder components, follow the maintenance procedures outlined in the table. If additional cleaning is needed or desired due to excessive debris found, follow the cleaning steps below.

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### 8.2.1 Equipment Needed

- PPE
  - Rubber gloves
  - Apron
  - Safety glasses
  - Long sleeved clothing
- Hose (for offline cleaning)

### 8.2.2 Cleaning Instructions

1. Allow feeder to consume as much of the chemical in the hopper as possible before getting started .
2. When hopper is empty, shut the inlet ½” ball valve to stop all water flow into the feeder.
3. With the booster pump and venturi still running and discharge ball valve still open, take a hose and spray down the inside of the hopper to clean off all remaining acid residue and debris
4. Remove the hopper from the base.
5. Take a hose and rinse the inside of the base and clean off any remaining acid residue and debris.
6. Ensure all solution or contamination is pulled out of the base by the venturi
7. Repeat steps 3 to 6 as needed to clean the feeder and discharge tubing
8. Open the ½” inlet valves to return the feeder to normal operation.

# 9 Troubleshooting Guide

**Table 5. Troubleshooting Guide**

Symptom	Probable Cause	Solution
No/low inlet water flow	Solenoid valve does not properly open.	Replace solenoid valve. Check with dealer
	½" Inlet ball valve closed	Open the inlet ball valve
	Inlet strainer plugged	Clean inlet strainer
	Booster pump not running	See booster pump section
	Emergency Shut Off Valve in Closed position	If ESV is stuck, lower gently to reset
Insufficient pH reduction	Feeder empty	Refill hopper with CCH® Dry Acid Plus
	No/low inlet water flow	See no/low water flow section
	Blocked discharge line	Check for debris within the discharge line and address as necessary
	Blocked check valve	Remove and clear debris from check valve
	Blocked or clogged venturi	Remove and inspect venturi. Clear any debris from suction port. If using with a CCH® Elite feeder, clean if necessary. Refer to CCH® Elite cleaning instructions, section 8.2.
	Shut inlet valve	Check inlet ball valve and fully open
Excessive pH reduction	ORP/chemical controller problem	Refer to chemical controller manual
Feeder overflow	Blocked discharge line	Check for debris within the discharge line and address as necessary
	Blocked or clogged venturi	Remove and inspect venturi. Clear any debris from suction port. If using with a CCH® Elite feeder, clean if necessary. Refer to CCH® Elite cleaning instructions, section 8.2.
	Insufficient outlet suction	Excessive pressure drop on the venturi outlet. Check with dealer.
	ESV Failure	Replace ESV. Check with dealer
	High inlet flow rate	Ensure all three blue spray nozzles are installed properly

# 10 Appendix

## 10.1 Requirements and Specifications

### 10.1.1 Requirements for Product Installation and Operation

**Table 6. Site Requirements**

<b>Recommended Clearance</b>	Feeder: 35" L x 35" W x 62" H [88.9 cm x 88.9 cm x 157.5 cm]
<b>Minimum Clearance</b>	Feeder: 23" L x 23" W x 50" H [58.4 cm x 58.4 cm x 127 cm]
<b>Water Inlet</b>	0.8 gpm [3.0 lpm] @ 30 psi [2.07 bar]
<b>Electrical – Solenoid</b>	Input: 100 - 240 VAC, 50 – 60 Hz, 1A max Output: 24V, 1.5A
<b>Electrical – Booster Pump (Solenis supplied)</b>	120/240 VAC, 1ph, 60Hz, 15A

**Table 7. Accessory Requirements**

<b>Chemical</b>	CCH® Dry Acid Plus
<b>Discharge Tubing</b>	½" [1.27 cm] OD Polyethylene flexible tubing
<b>Water Inlet Tubing</b>	½" [1.27 cm] OD Polyethylene flexible tubing

### 10.1.2 Product Specifications

**Table 8. Operational Specifications**

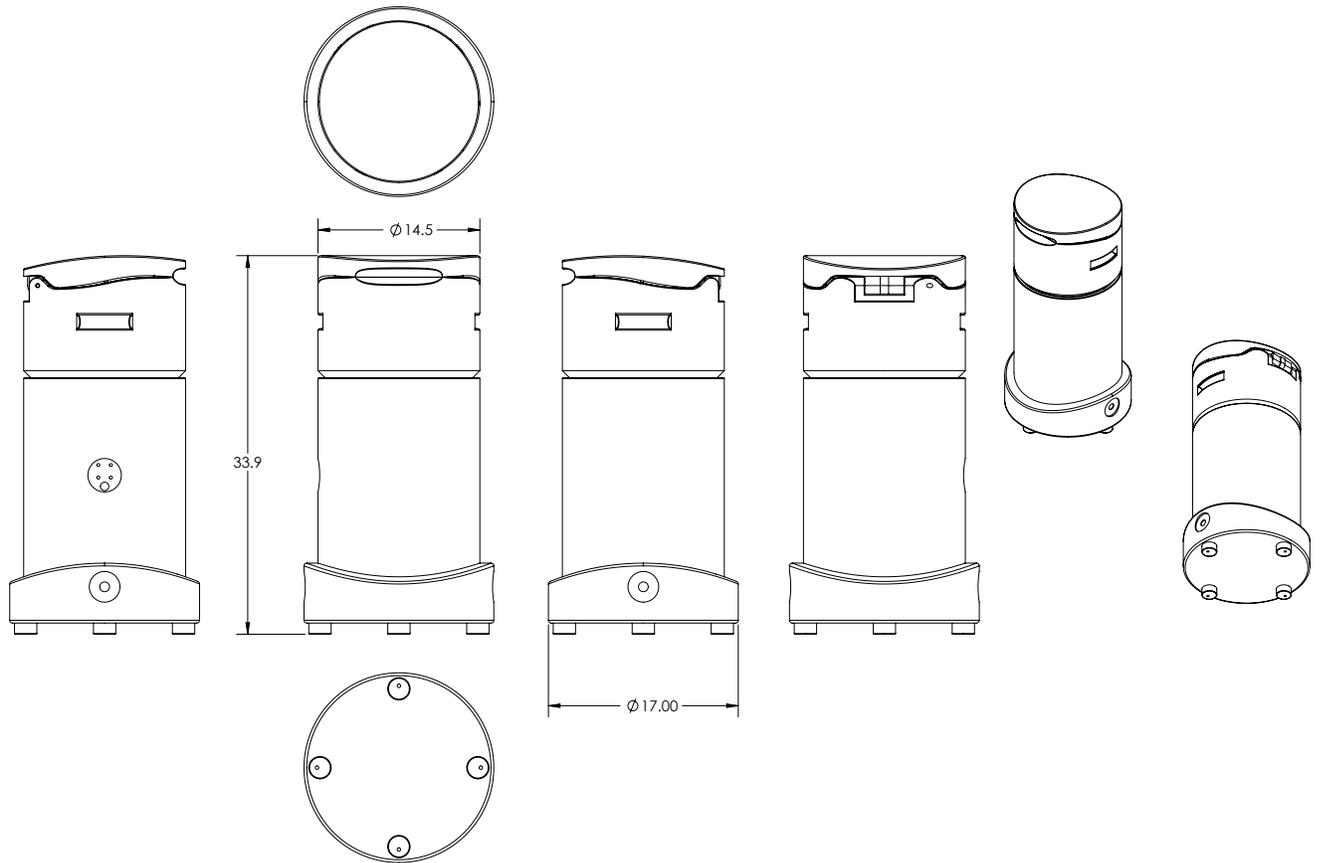
<b>Dry Chemical Capacity</b>	60 lbs. [27.2 kg]
<b>Tank Size (Solution Volume)</b>	5 gallons [18.9 liters]
<b>Water Inlet Size</b>	½" [1.6 cm] OD
<b>Solution Outlet</b>	½" [1.6 cm] OD
<b>Shipping Weight</b>	Approximately 70 lbs. [31.8 kg]
<b>Operating Weight</b>	Approximately 220 lbs. [100 kg]
<b>Operating Temperature</b>	40°F – 130°F [4.4°C – 54.4°C]
<b>Feeder Dimensions</b>	17" L x 17" W x 34" H [43.2 cm x 43.2 cm x 86.4 cm]
<b>Solenoid Cable</b>	72" [1.8 m]

**Table 9. Chemical Feed Rate Specifications**

<b>Acid Delivery Rate</b>	990.0 lbs/day [450 kg/day] Maximum of 41.25 lbs/hr [18.75 kg/hr]
<b>Solution Strength</b>	10 lbs of CCH® Dry Acid Plus (92.3% sodium bisulfate) = 1 gal. of 20 Baume muriatic acid (32% HCL)
<b>Water Inlet</b>	0.8 gpm [3.0 lpm] @ 30 psi [2.07 bar] & 0.9 gpm [3.4 lpm] @ 40 psi [2.76 bar]
<b>Venturi Discharge Rate</b>	3 gpm [11.4 lpm] @ nominal venturi operation
<b>Recommended Pool Size (For guidance only, see notes)</b>	Up to 1,000,000 gal.

**Note:** The main function of the CCH® Dry Acid Plus is to neutralize the pH increase effects of. 10 lbs of cal hypo needs approximately 1.2 lbs of sodium bisulfate to keep the pH balanced. Consequently, total acid use is dependent on chlorine demand in lieu of physical pool size. Refer to your site-specific cal hypo use (lbs/day or lbs/week) to estimate sodium bisulfate need.

### 10.1.3 Product Footprint

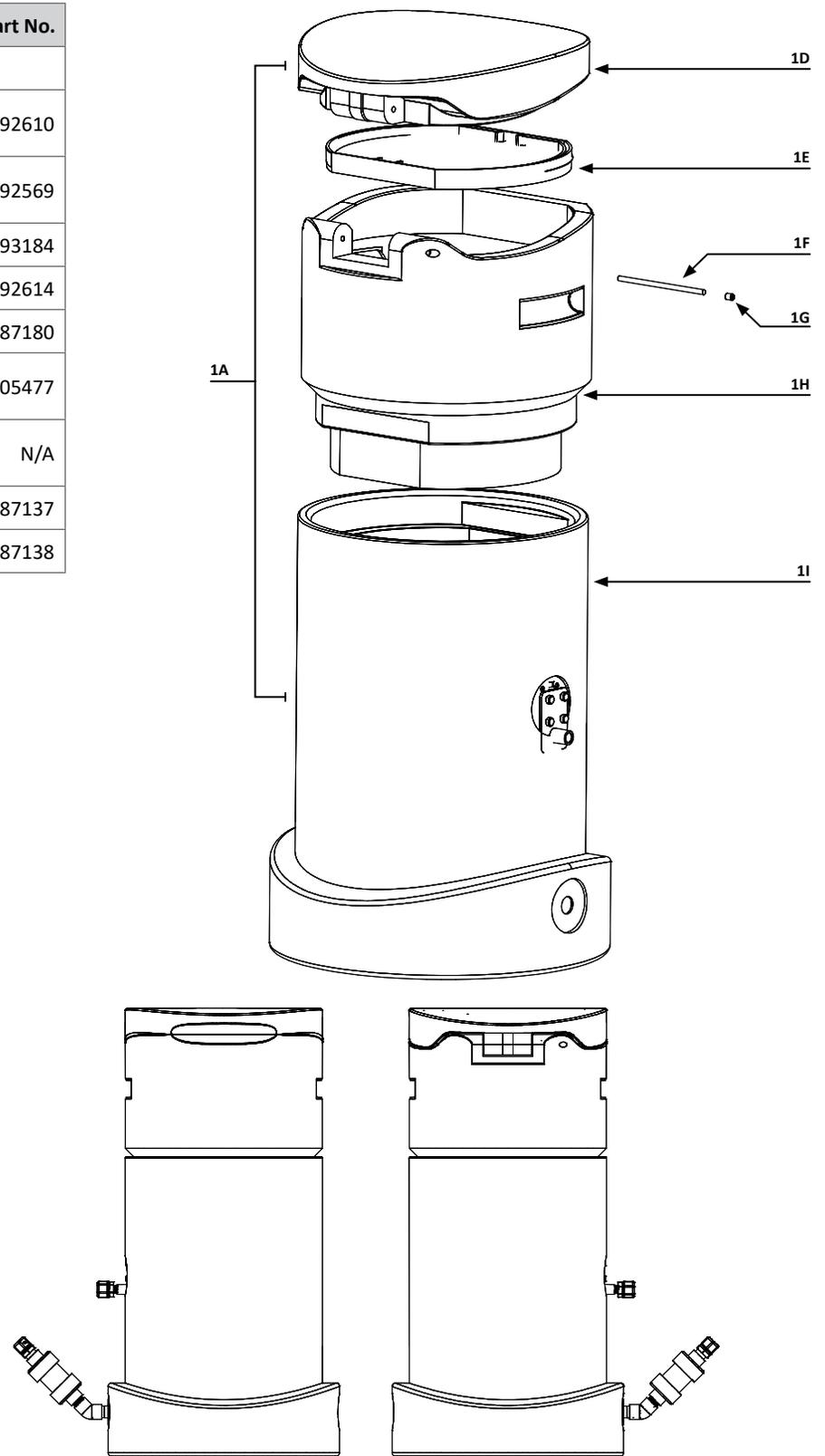


**Figure 7. Product Footprint**

## 10.2 Replacement Parts List and Views

Figure 8. Major Feeder Components View

Part	Description	Part No.
1	HOPPER AND BASE COMPONENTS	
1A	CCH® Acid Plus feeder assembly (body only)	892610
1B	CCH® Acid Plus feeder system (with installation kit - not shown)	892569
1C	CCH® Acid Plus DUO (not shown)	893184
1D	Lid with label, CCH® acid feeder	892614
1E	Granular screen assembly	887180
1F	Hinge rod, PVC 0.25 x 5.5L (comes with set screw)	205477
1G	Set screw for hinge rod, Hex 5/16-18 x 0.5L	N/A
1H	Chemical hopper	887137
1I	Solution base	887138



Part	Description	Part No.
2	BASE - INLET COMPONENTS	
2A	Elbow tubing connector 3/8" OD x NPT, P6ME6	205487
2B	Spray nozzle 1/4" NPT, lechler	205485
2C	Spray manifold	205928
2D	Tubing 3/8" PE E-64-0500	205460
2E	Emergency shut off valve assembly	205442
2F	Tubing connector 1/2" OD x 1/4" NPT, P8MC4	205482
2G	Emergency shut off mounting plate	205451
2H	Emergency shut off valve with arm only	205450
2I	Emergency shut off float plate	71539
2J	Rubber gasket for emergency shut off valve	205540
2K	Emergency Shut Off Float Plate PVC Nut	205453
2L	Emergency shut off overflow float	205454

Figure 9. Base Inlet Components

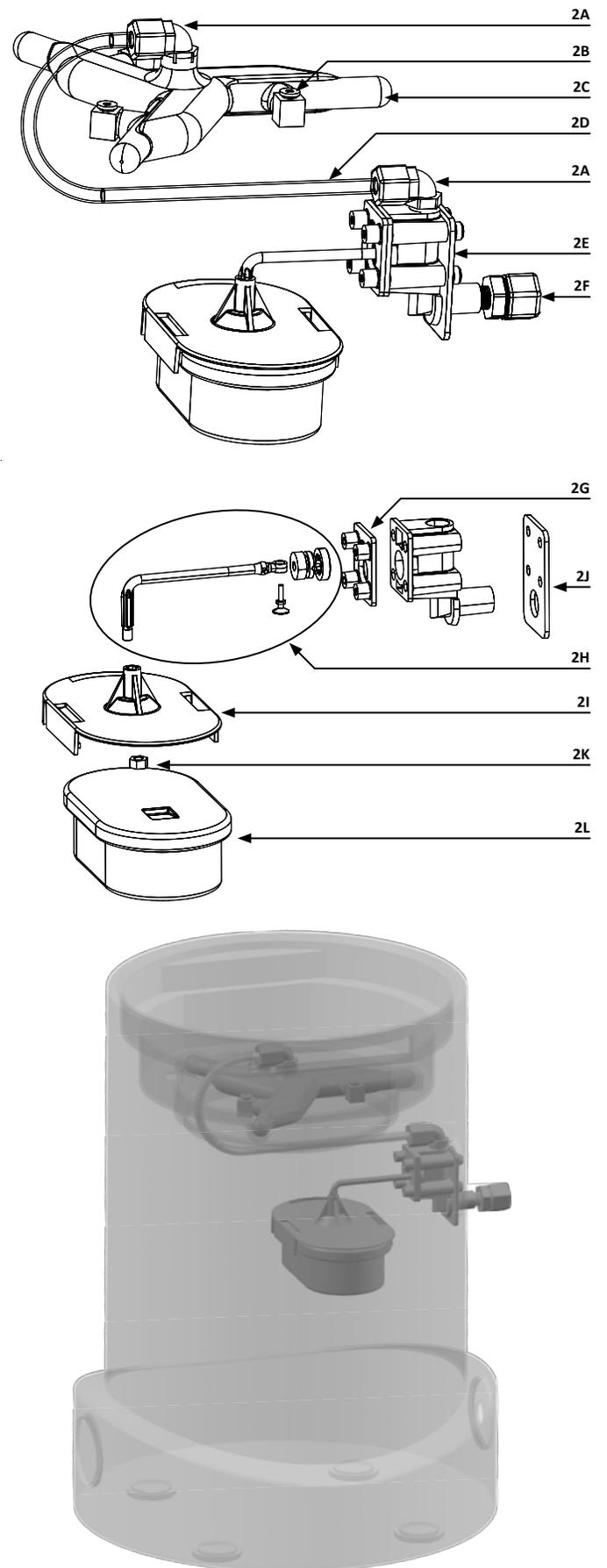
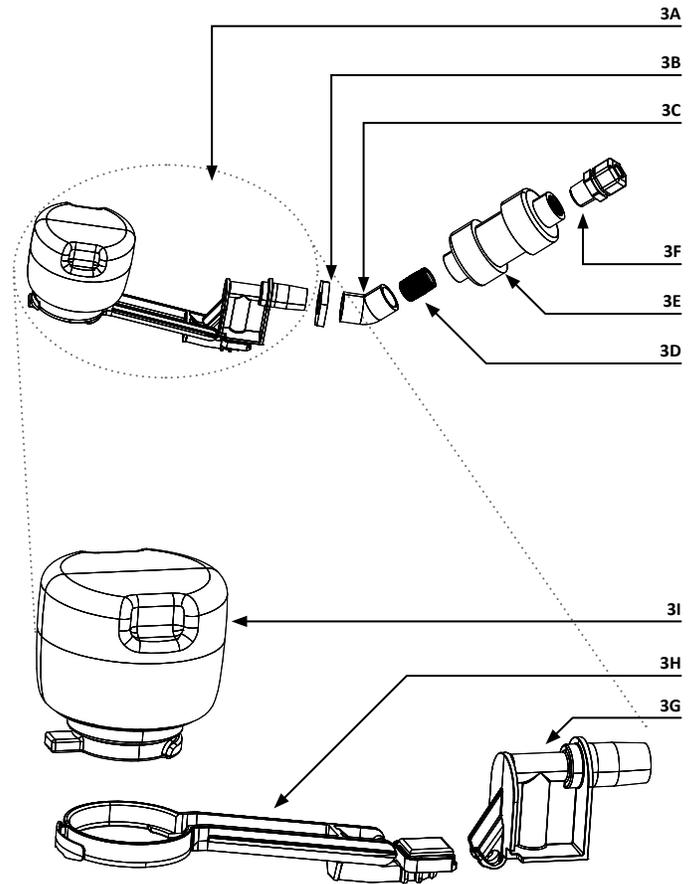


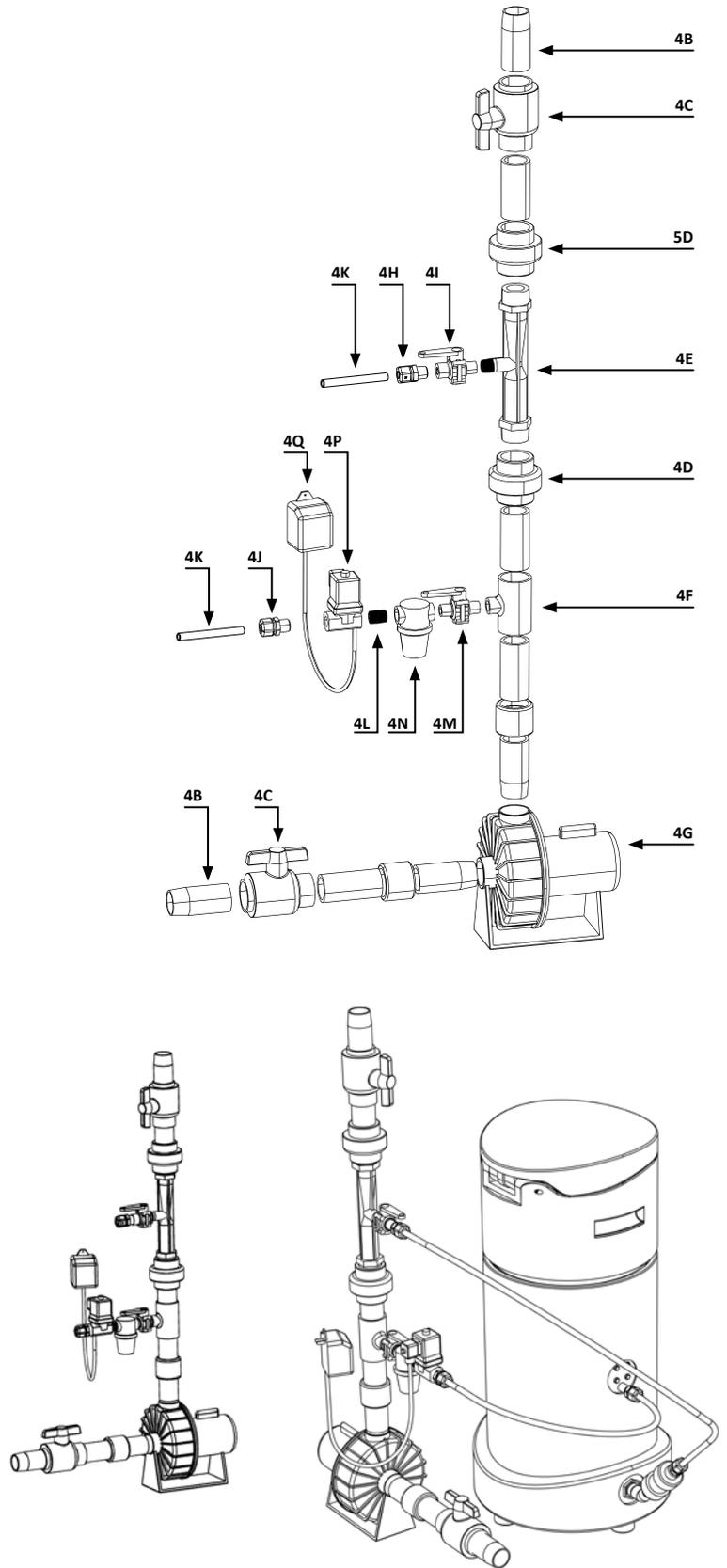
Figure 10. Base Outlet Components

Part	Description	Part No.
3	BASE - OUTLET COMPONENTS	
3A	Discharge valve assembly	206078
3B	DV nut	71538
3C	Elbow threaded ½" sch. 80 PVC 45°	205963
3D	Nipple ½" fully threaded PVC	205480
3E	Threaded check valve 4721K13	205959
3F	Connector male ½" P8MC8	71890
3G	DV body	206080
3H	DV arm	206079
3I	DV float	79810
3J	Silicone washer, 1.5 OD x ¾" ID x ⅛" thk (not pictured)	71576



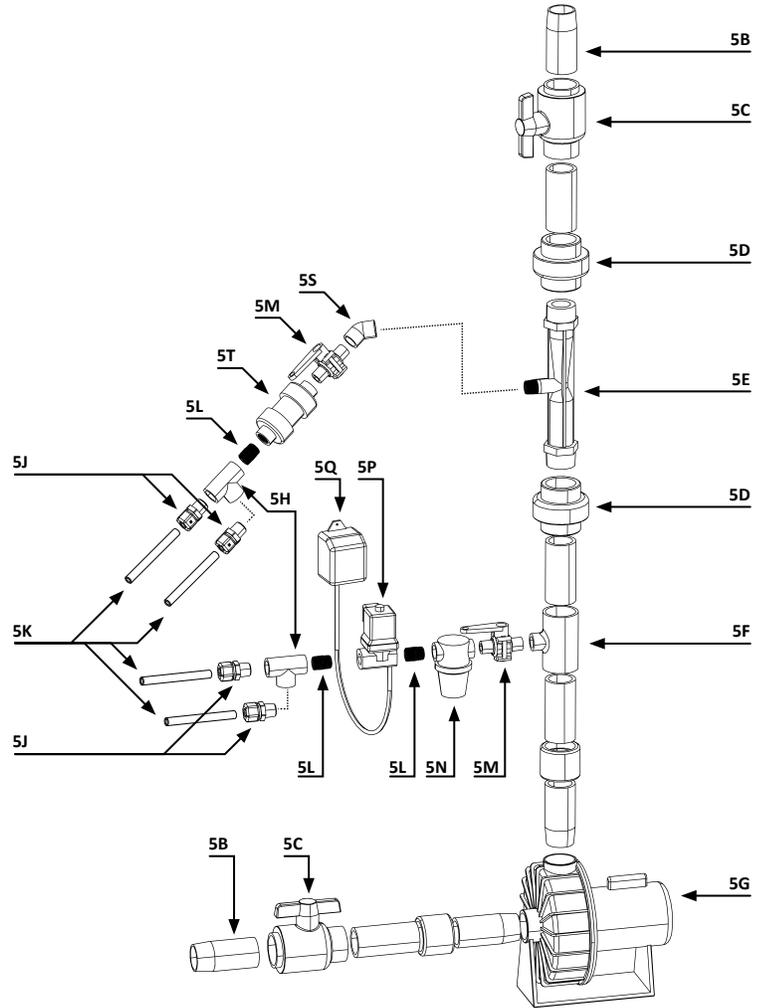
Part	Description	Part No.
4	BASE - OUTLET COMPONENTS	
4A	Installation kit	79830
4B	1-½" X 12" PVC Nipple	71548
4C	1-½" Slip PVC sch. 40 ball valves	205543
4D	Venturi union, 1-½" slip x NPT	71907
4E	Venturi, 1-½" NPT, 1585X PVDF	205959
4F	1-½" X ½" sch. 80 PVC Tee	71547
4G	1 HP booster pump	205955
4H	Female ½" NPT x ½"OD Tubing	205466
4I	Ball valve, ½" NPT, M x F	205491
4J	½" OD x MNPT tubing connector, W8MC8	71890
4K	Tubing - 20' ½" OD PE	205490
4L	Closed nipple, ½" NPT	205545
4M	Ball valve, ½" NPT, M x M	205489
4N	Line strainer, ½" FNPT	206084
4O	Basic ORP Kit, includes one transformer, one solenoid valve, one interchangeable plug for N. America/ Japan, one Closed Nipple, one strainer, and two tubing connectors (not shown)	73389
4P	Solenoid valve, 24 VDC Granzow	73114
4Q	Transformer with DIN/LED, 6' DIN cord	73113
4R	Interchangeable plug for N. America/ Japan (not shown)	73140

Figure 11. Booster Pump and Venturi Assembly, Single



Part	Description	Part No.
5	ACID PLUS DUO OUTLET COMPONENTS	
5A	Installation Kit	79830
5B	1-½" X 12" PVC Nipple	71548
5C	1-½" Slip PVC sch. 40 ball valves	205543
5D	Venturi union, 1-½" slip x NPT	71907
5E	Venturi, 1-½" NPT, 1585X PVDF	205959
5F	1-½" X ½" sch. 80 PVC Tee	71547
5G	1 HP Booster Pump	205955
5H	Female ½" NPT x ½"OD Tubing	205466
5I	<i>unused</i>	
5J	½" OD x MNPT tubing connector, W8MC8	71890
5K	Tubing - 20' ½" OD PE	205490
5L	Closed Nipple, ½" NPT	205545
5M	Ball valve, ½" NPT, M x M	205489
5N	Line strainer, ½" FNPT	206084
5O	Basic ORP Kit, includes one transformer, one solenoid valve, one interchangeable plug for N. America/ Japan, one Closed Nipple, one strainer, and two tubing connectors (not shown)	73115
5P	Solenoid valve, 24 VDC Granzow	73114
5Q	Transformer with DIN/LED, 6' DIN cord	73113
5R	Interchangeable plug for N. America/ Japan (not shown)	73140
5S	Elbow threaded ½" sch. 80 PVC 45°	205963
5T	Threaded check valve 4721K13	205959

Figure 12. Booster Pump and Venturi Assembly, Acid Plus DUO



# Limited Warranty

The CCH® Acid Plus Feeder is warranted against any manufacturing defects in material or workmanship for a period of 12 months after installation or 18 months after shipping from Solenis, whichever is earlier. This warranty applies only to the original end-user.

To register your feeder please visit [cchpoolcare.com](http://cchpoolcare.com)

## Service

For warranty service, contact the authorized CCH® Dealer in your area. Any defective part(s) covered by this warranty will be repaired or replaced, at Solenis's discretion. Replacement may be with either new or reconditioned parts.

## Exclusions

This warranty does not cover damage or failure due to accidents, fire, flood, or other acts of God. Nor does it cover damage or failure due to abuse, misuse, abnormal or improper use, neglect, improper maintenance, alterations, or modifications by anyone other than Solenis (unless specifically approved in writing by Solenis), repairs by anyone other than an authorized Dealer, or ordinary wear and tear.

Use of any other chemicals other than the CCH® Dry Acid Plus designed for use with this chlorinator shall void this warranty.

Any transportation to and from an authorized CCH® Dealer is your responsibility.

Neither Solenis nor its Dealers are responsible or liable for indirect, special, or consequential damages arising out of or in connection with the use or performance of the product or other damages with respect to loss of property, loss of revenues or profit by the owner. EXCEPT AS PROVIDED ABOVE, Solenis MAKES NO WARRANTIES. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS SPECIFICALLY EXCLUDED.

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**Note:** No modifications may be made to the feeder without prior written approval from Solenis. Unauthorized modifications void any warranty. This CCH® Acid Plus Feeder is subject to one or more patents owned by Solenis, and all rights in any modifications or improvements, including but not limited to any patents, copyrights, trademarks or trade secrets, belong exclusively to Solenis.

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For information, contact Innovative Water Care at (800) 478-5727.

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