



CO₂ Feed System

OPERATION AND MAINTENANCE MANUAL

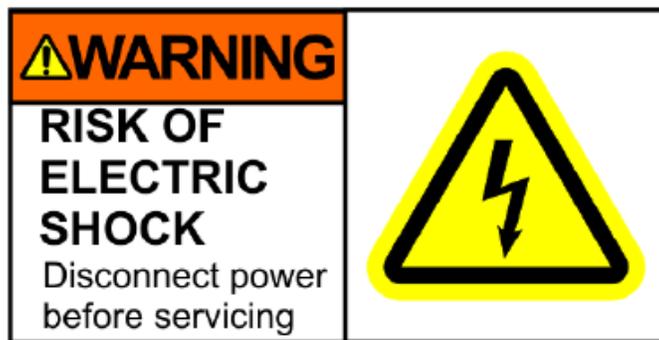
The Eko³ Systems CO₂ Feeder is housed in a NEMA 4X (IP65) enclosure. It should not be used in explosive environments. The CO₂ Feeder should be mounted so that adequate ventilation is provided around the enclosure, preventing general environmental specifications from being exceeded (see table below).

Environmental Specifications

Specification	Rating
Storage Temperature	-30 to 60 Deg C
Ambient Operating Temperature	-20 to 50 Deg C
Ambient Humidity	95% non condensing maximum humidity

Electrical Specifications

Voltage:	115VAC / 50/60Hz
Phase:	Single
Current	0.2 Amp Full Load



Installing the Eko³ CO₂ Feeder

A – 1: Eko³ CO₂ Feeder Location

The Eko³ CO₂ Feeder should be mounted in a location that is free from chemical fumes and excessive heat, isolated from electrical interference, and near a power source protected by a ground fault interrupter. The CO₂ Feeder requires a CO₂ cylinder and regulator. The CO₂ cylinder should be located within several feet of where the feeder will be mounted. The feeder is equipped with a 6-foot power cord. The feeder should be mounted close enough to the water chemistry controller so that its power cord may be plugged into the pH feed output.

The CO₂ Feeder should also be mounted within 6-8 feet of the point of gas injection. A 10-foot length of tubing is supplied but several feet will be used to connect the CO₂ cylinder and regulator to the feeder.

A – 2: Mounting the Eko³ CO₂ Feeder

The Eko³ CO₂ feeder should be mounted to the wall with four anchor bolts, one installed in each corner of the enclosure base. To mount the feeder properly, please use the included mounting template and hardware. Drill the holes for the anchors using a 3/16" drill bit. Install the anchors in the wall. Remove the lid from the unit and place the included screws in the four corners of the box. Attach the screws into the anchors. The feeder and water chemistry controller have NEMA4 weather resistant enclosures but should still be protected if mounted outdoors.

A – 3: Eko³ CO₂ Feeder Connections

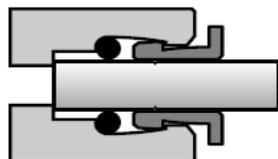
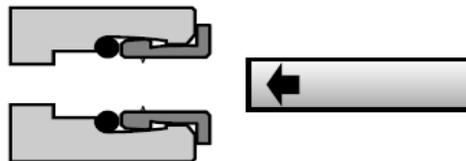
Plug the Eko³ CO₂ Feeder power cord into the water chemistry controller pH feed output. The water chemistry controller pH feed output must be wired to a NEMA 5-15 receptacle. Connect a section of 3/8" polyethylene tubing from the CO₂ cylinder pressure regulator to the IN port of the feeder. The feeder is equipped with push to connect fittings, see the assembly instructions below.

Method of assembly



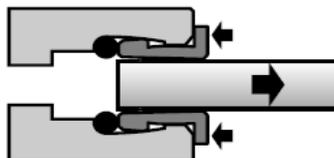
1. Ensure that the end tube is cut square and is free from burrs.

2. Push the tube through the collet into the fitting.



3. Push the tube firmly through the 'O' ring until it bottoms on the tube stop, then pull back.

4. To disconnect, push the tube into the fitting, hold down the release button and withdraw the tube.



B – 1: Taping the Fittings

When assembling the eductor, first open the bag of eductor fittings and wrap each fitting three times around clockwise with Teflon tape. Do not use pipe joint compound on these threads.

B – 2: Eductor Location

The following are considerations as to where and how the eductor should be installed:

1. The Eko³ CO₂ Feeder and regulator should already be mounted and ready to use.
2. The feeder should be within 6 to 8 feet of the point of gas injection.
3. A side stream should be established with a consistent positive differential in pressure of at least 5 PSI. If this cannot be accomplished, a booster pump may be needed. (booster pump should be able to deliver 30 PSI at 8.5 GPM.)
4. The output of the eductor side stream should be in the recirculation pipe at a point downstream of the pool heater.
5. The input of the eductor side stream should be installed just after the recirculation pump.

B – 3: Eductor Connections

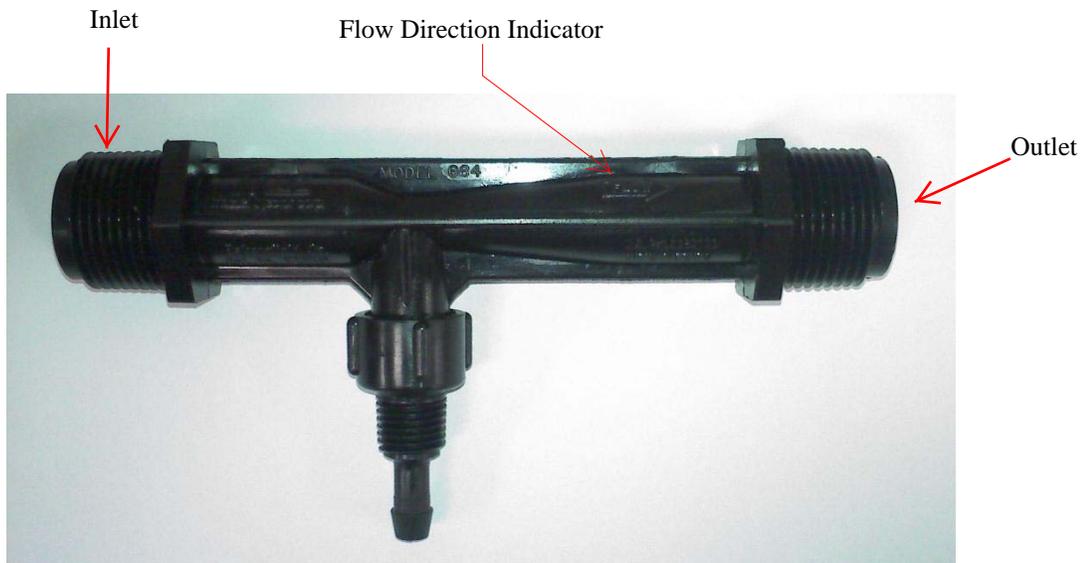
1. Drill and tap a 3/4 NPT hole in the discharge pipe between the recirculation pump and filter. The water inlet side of the eductor should be installed here. It is recommended that a valve, no smaller than 1/2 NPT, should be installed before the eductor to allow the eductor to be cleaned or serviced. The eductor kit includes a reducer coupling and 1/2 NPT nipple.

2. Drill and tap a 1/2 NPT hole in the recirculation pipe downstream of the pool heater. The 5/8" tube fitting (included) should be installed here. If a valve was used before the eductor, another should be used here.

3. A reducer coupling and 5/8" tube fitting (included) should be attached to the water outlet side of the eductor.

4. Use all 15 feet of the 5/8" polyethylene tubing to connect the water outlet of the eductor to the tube fitting in the recirculation pipe. Using the whole length of tubing will allow the CO₂ more time to mix with the water and will result in a more efficient use of CO₂. Run the tubing as straight as possible to allow for more flow and less of a pressure drop (i.e. do not coil the excess tubing).

5. Connect one end of the 3/8" polyethylene tubing to the OUT port of the feeder. Push the other end of the tubing onto the hose barb fitting on the eductor.



C – 1: Taping the Fittings

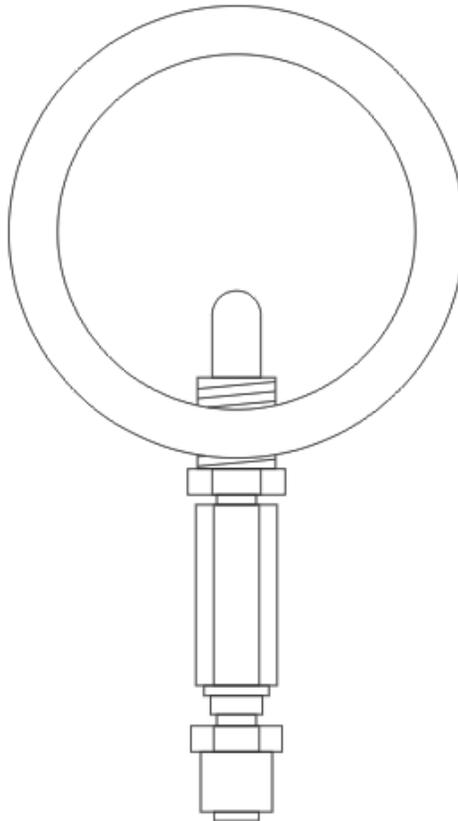
Wrap the diffuser fitting three times around clockwise with Teflon tape. Do not use pipe joint compound on this thread.

C – 2: Diffuser Location

The diffuser assembly must be located in the recirculation pipe downstream of the pool heater. The Eko³ CO₂ Feeder should be within 6 to 8 feet of the point of gas injection. The recommended method of mounting is from the bottom of a horizontal pipe as shown below.

C – 3: Diffuser Connections

1. Drill and tap a 1/2 NPT hole in the recirculation pipe downstream of the pool heater. The diffuser assembly should be installed here. The diffuser assembly contains a check valve to allow disconnecting the tubing without disrupting the flow of water in the recirculation pipe. A separate valve is not necessary. The diffuser must be in the flow of water.
2. Connect one end of the 3/8" polyethylene tubing to the OUT port of the feeder.
3. Connect the other end of the tubing to the push to connect fitting of the diffuser assembly.



START UP

D – 1: Installation Check

Double check all connections making sure they are tight.

D – 2: CO₂ Cylinder

1. Turn the adjustment knob on CO₂ cylinder pressure regulator counterclockwise until no tension is felt. This will set the regulator pressure output to zero.

2. Fully open the CO₂ cylinder shut off valve. The regulator input pressure gauge should show about 800 to 1000 PSI.

3. Adjust the regulator output to 40 to 60 PSI.

D – 3: CO₂ Setting

1. Turn the Rate of Flow adjustment knob on the feeder clockwise until it stops. This will set the rate of flow to zero.

2. Energize the valve of the feeder by switching the water chemistry controller to manual or by lowering the setpoint.

3. Adjust the Rate of Flow knob on the feeder counterclockwise until the flowmeter shows a rate of approximately 15 SCFH (Standard Cubic Feet per Hour).

4. Reset the water chemistry controller to automatic control, or return the setpoint to the normal setting.

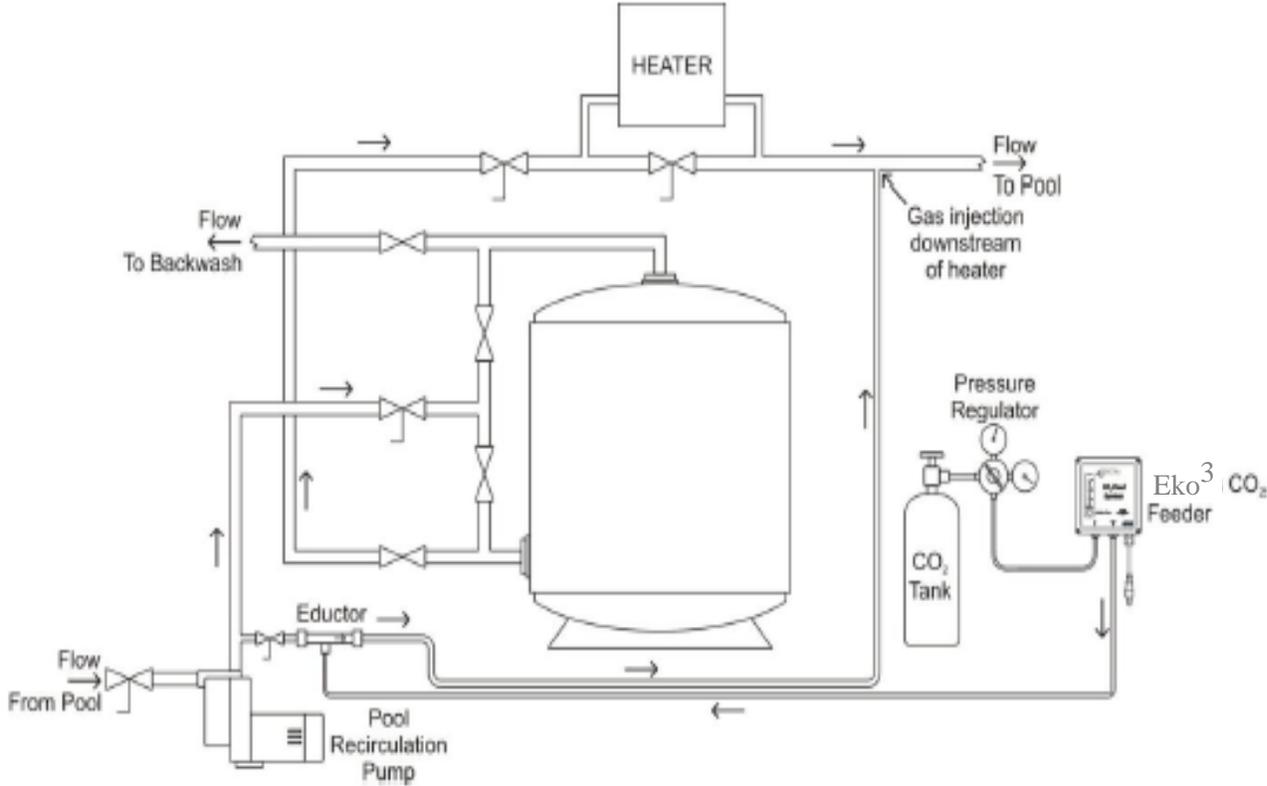
5. Once the system is in automatic control, the rate of flow can be adjusted to maintain the desired pH level.

MAINTENANCE

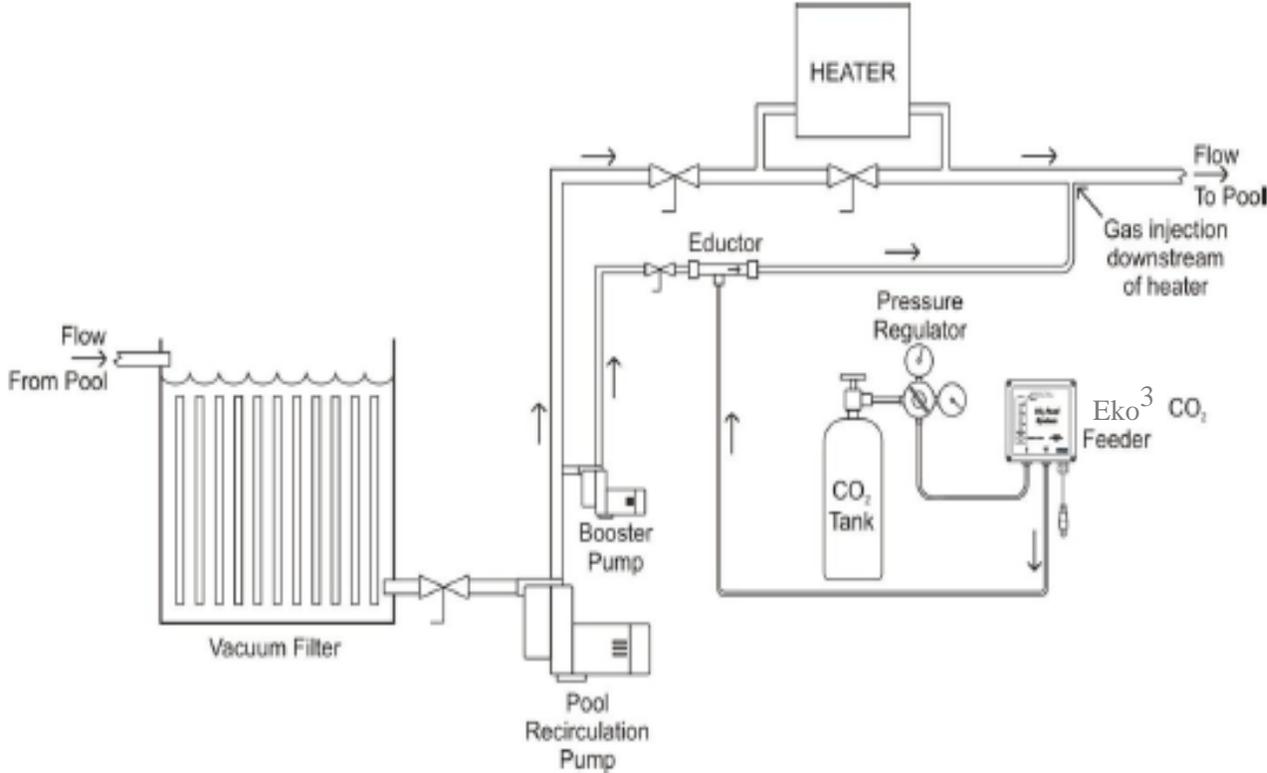
The Eko³ CO₂ Feeder requires no maintenance other than a periodic rate of flow check and CO₂ cylinder refill.

INSTALLATION DIAGRAMS

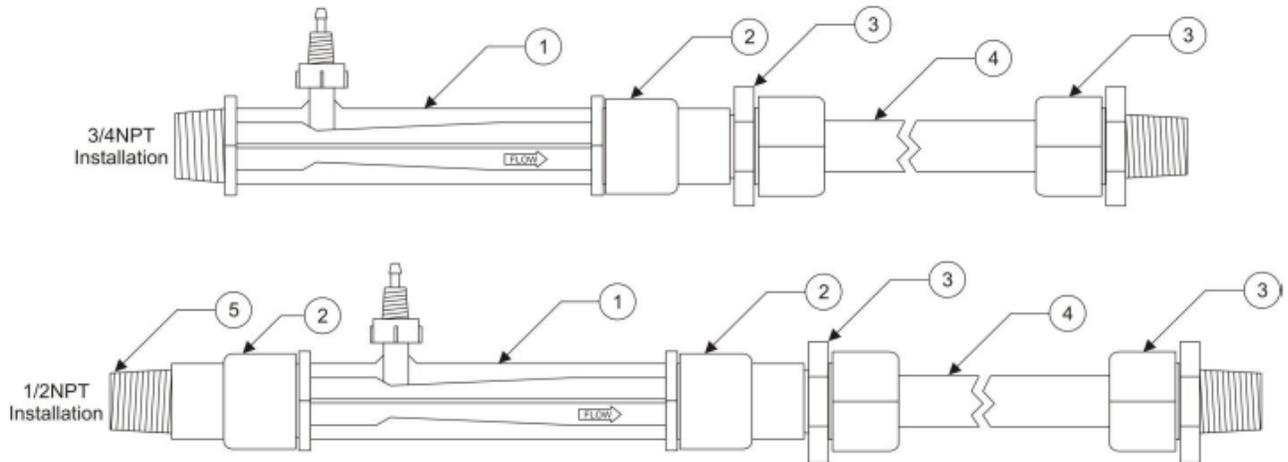
G - 1: Pressure Filter Installation



G - 2: Vacuum Filter Installation

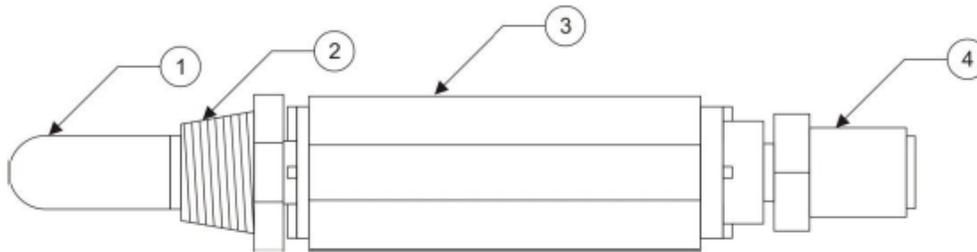


G – 3: Eductor Assembly



Eductor Assembly		
Item	Part Number	Description
1	8060795	Eductor
2	8060796	3/4NPT x 1/2NPT Reducer Coupling
3	8060797	Compression Fitting, 1/2NPT x 5/8 Tube
4	8060802	5/8 OD Tubing, 15ft.
5	8060541	Pipe Nipple, 1/2NPT x Close

G – 4: Diffuser Assembly



Diffuser Assembly		
Item	Part Number	Description
1	8060794	Diffuser
2	2220353	Diffuser Bushing
3	8060792	Check Valve, 1/4NPT
4	8060757	1/4NPT Straight Adapter, 3/8 Tube

Section H: Replacement Parts

BEC Sys CO ₂ Feeder	
Valves	
2210306	Valve, 115VAC
2210309	Valve, 230VAC
Flowmeters	
8060752	Flowmeter, 4-30SCFH
8060753	Flowmeter, 20-200SCFH
Push to Connect Fittings	
8060788	Bulkhead Union, 3/8 Tube
8060789	Stem Adapter, 3/8 Tube
8060790	3/8NPT Elbow Adapter, 3/8 Tube
8060791	1/8NPT Straight Adapter, 3/8 Tube
Fasteners	
8060168	10-32x3/8 Machine Screw, Flowmeter
8060204	#10 Split Lock Washer, Flowmeter
8060787	10-24x3/8 SEMS Machine Screw, Valve
8060799	10-24 KEPS Nut, Valve mounting Panel

Injectors	
Diffuser	
2220353	Diffuser Bushing
8060757	1/4NPT Straight Adapter, 3/8 Tube
8060792	Check Valve, 1/4NPT
8060794	Diffuser
8060801	3/8 OD Tubing, 10ft.
Eductor	
8060541	Pipe Nipple, 1/2NPT x Close
8060795	Eductor
8060796	3/4NPT x 1/2NPT Reducer Coupling
8060797	Compression Fitting, 1/2NPT x 5/8 Tube
8060801	3/8 OD Tubing, 10ft.
8060802	5/8 OD Tubing, 15ft.



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