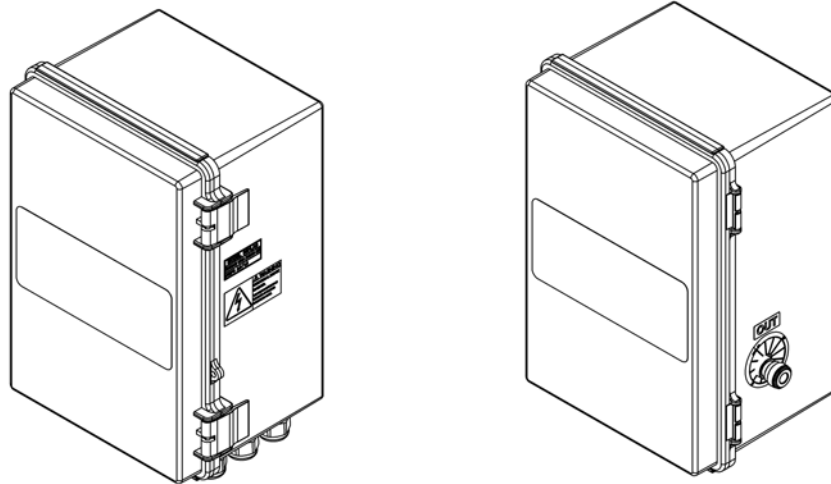


Easy Dose

Chemical Injection and Dispensing System

DEMA Engineering Company



Overview

The DEMA® Easy Dose is a simple and reliable chemical delivery system. Easy Dose features an electronic control system coupled with up to two electric diaphragm pumps for precise injection of chemical in a variety of applications. Additionally, the system can be coupled with electronic flow meter technology allowing Easy Dose to automatically adjust chemical injection rates based on water line flow conditions.

Warnings



Installation of DEMA products must meet all applicable electrical codes and regulations established by national, city, county, parish, provincial or other agencies. It is possible that electrical codes and regulations require that a certified electrical contractor or engineer perform the electrical installation. For questions, contact a certified electrician.



All installations must conform to local plumbing codes and use approved backflow prevention devices. A pressure indicating tee is to be installed with existing faucets according to local plumbing codes in the state of Wisconsin and any other state that requires the use of a pressure indicating tee.



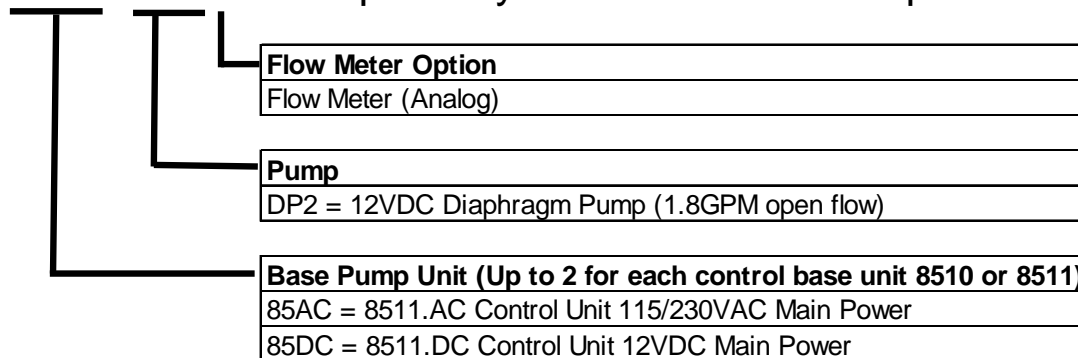
ALWAYS WEAR PROTECTIVE CLOTHING AND EYEWEAR WHEN WORKING WITH CHEMICAL PRODUCTS.

Easy Dose Models

Easy Dose can be ordered as a complete system that includes the control unit and the pump unit or control unit and pump units can be ordered individually. The Easy Dose Control module can support 2 pump modules. Each pump module can be individually controlled with a speed control pot.

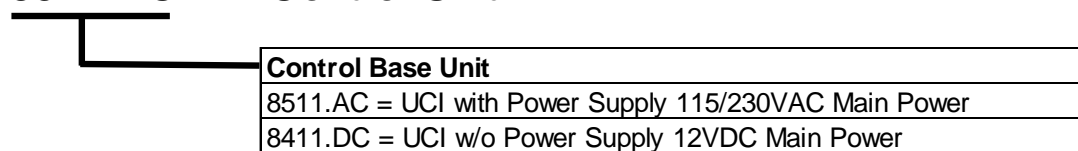
- 85AC or 85DC Models are Complete Systems – include the control and pump units, flow meter option
 - If a second pump is required order an 8512 unit
- 8511 Models are Control Units – choose AC or DC
 - AC – accepts 115/230VAC 50/60Hz (comes wire with 115VAC power cord with plug)
 - DC – accepts 12VDC designed to be operated with 12VDC mobile equipment battery (car battery)

85AC.DP2F Complete System Control & Pump Unit

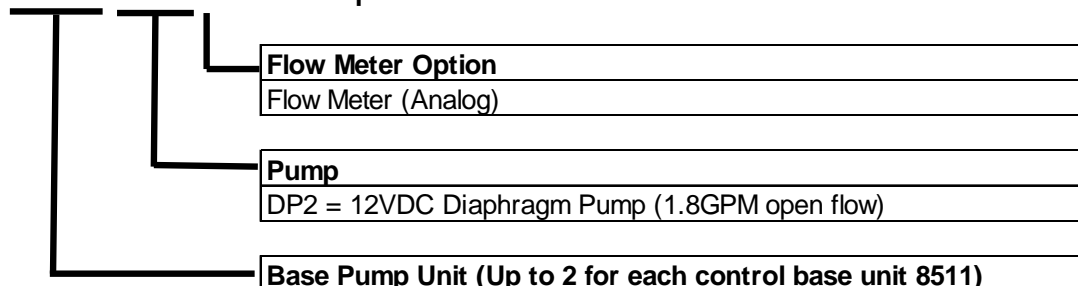


This model number includes both the control unit and a pump unit in a single shipping package. A second pump unit can be added by ordering a 8512 pump unit shipped in a second package.

8511.AC Control Unit



8512.DP2F Pump Unit



Packing Kit List

The following installation kit parts are included with the Easy Dose. The 85AC and 85DC models include an 8511 and 8512 module.

Kit Parts with 8511.AC & 8511.DC		
Part Number	Qty	Description
85.109.1	3	Strain Relief (for installing sensor and float switch cables)
58.400.2	3	Nylon Nut (used to mount 85.109.1 strain relief)

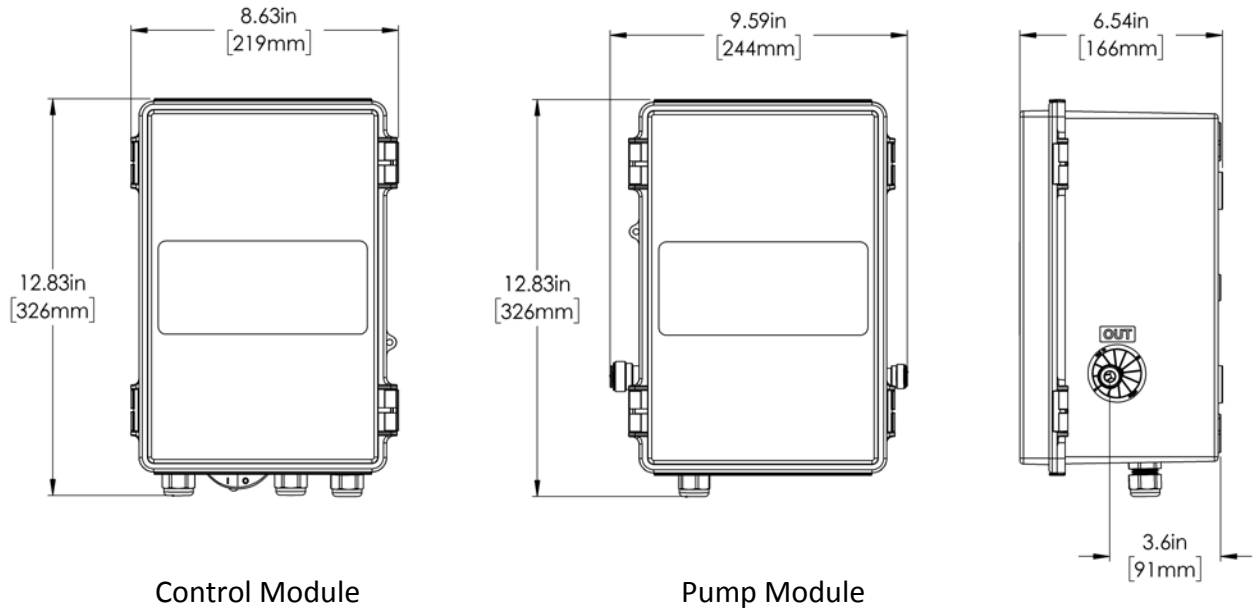
Kit Parts for 8512		
Part Number	Qty	Description
85.127.1	1	Quill Chemical Injection Fitting (water/irrigation line injection point)
25.115	1	3/8" OD x 20ft LDPE Tubing (for pump discharge to quill)
85.132.1	1	3/8" ID x 20ft PVC Tubing w/strainer (for chemical reservoir to pump inlet)
85.118.1	1	Float Switch Assembly (for shutting off system when chemical reservoir is empty)
76.2.17	1	Tubing clamp (used to secure 85.132.1 tubing to pump inlet fitting)
85.134.1	1	3/8" Barb x 1/2" Stem (used at inlet of pump to connect 85.132.1 tubing)
85.133.2	1	1/2" JG x 1/2" Stem elbow (used to configure a right angle connection at inlet of pump)
85.133.1	1	3/8" JG x 3/8" Stem elbow (used to configure a right angle connection at outlet of pump)
81.16.5	20	Tie Wraps (for securing tubing and cables)

8512.DP2F only (the following is packed with the 8512 kits parts)		
Part Number	Qty	Description
85.128.1	1	Flow Meter-sight glass/analog (Optional flow meter to determine chemical injection rate)
85.125.1	2	1/2" Mounting Clamp (for mounting 85.128.1 flow meter to wall/vertical surface)

Product Specifications

Easy Dose Product Specifications	
Main Power Requirement	115/230VAC 2A/1A 50/60Hz
Control Board Power	12VDC
Pump Motor Output Connection at Control Board	12VDC 10A per pump connection
Flow Meter Technology Control Connection	4-20mA/0-5V (electronic flow meter connection)
Float and Flow Switch Connections	Dry Contact
Power Supply	115/230VAC 50/60Hz input, 12VDC 25A output
Enclosure Material	Polycarbonate UV Rated
Environmental Rating	IP51
Control Module Weight	22lbs (10kg)
Pump Module Weight	12lbs (5.4kg)
Usage Location	Indoor/Outdoor - mounted off ground

Overall Size



Installation



WARNING: INSTALLATION OF DEMA PRODUCTS MUST MEET ALL APPLICABLE ELECTRICAL CODES AND REGULATIONS ESTABLISHED BY NATIONAL, CITY, COUNTY, PARISH, PROVINCIAL OR OTHER AGENCIES. IT IS POSSIBLE THAT ELECTRICAL CODES AND REGULATIONS REQUIRE THAT A CERTIFIED ELECTRICAL CONTRACTOR OR ENGINEER PERFORM THE ELECTRICAL INSTALLATION. FOR QUESTIONS, CONTACT A CERTIFIED ELECTRICIAN.

ALL ELECTRICAL POWER MUST BE TURNED OFF TO BUILDING CIRCUITS AND ASSOCIATED EQUIPMENT AT ELECTRICAL SERVICE PANELS. LOCKOUT & TAG PROCEDURES MUST BE OBSERVED WHEN PERFORMING ELECTRICAL WIRING PROCEDURES. UNIT MUST BE GROUNDED (EARTHED).

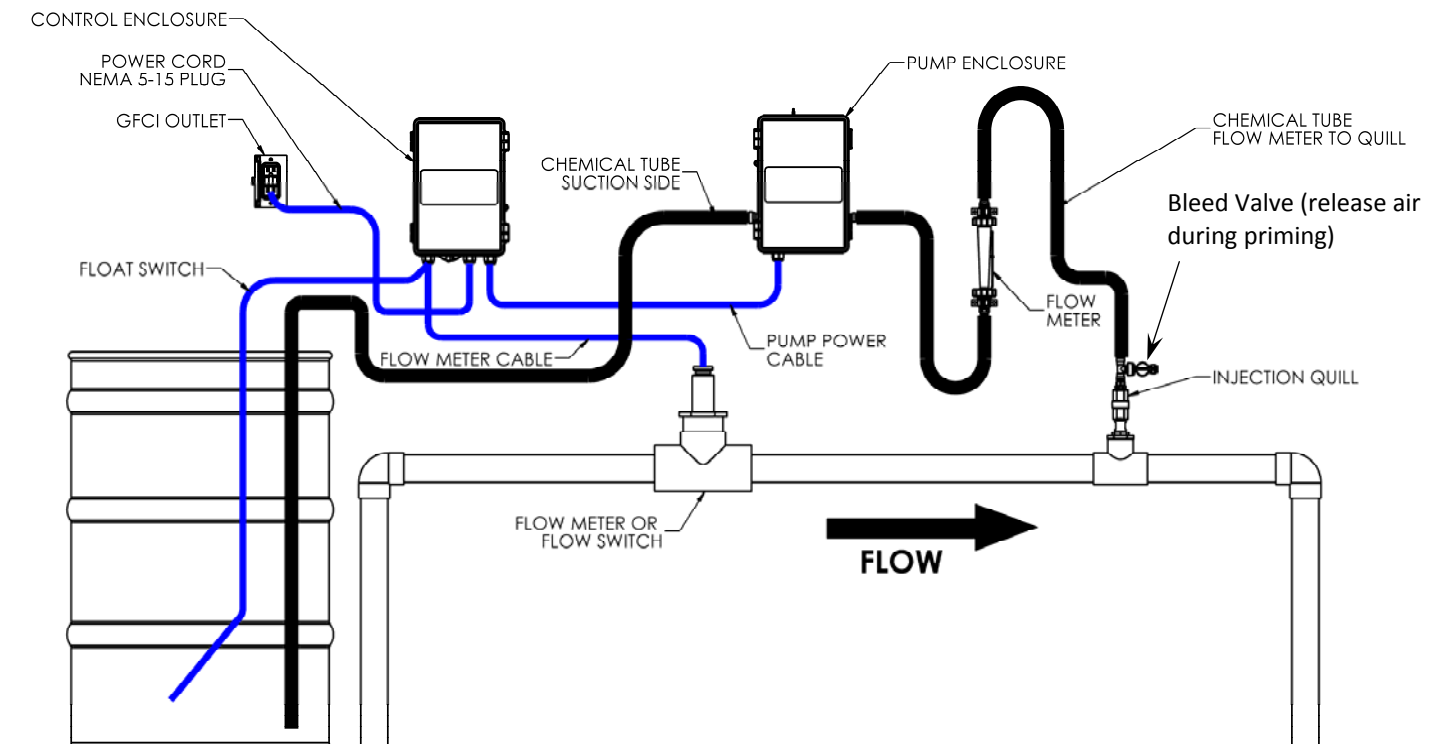
Note: Refer to Installation Diagrams on Page 6 & 7

1. Mount the control module and pump module on the wall using the metal brackets that are supplied with each unit. The brackets will space the units from the wall allowing proper ventilation. The following must be considered when picking the location to mount the modules:
 - a. 8511AC Control Module - Main power cord is approximately 10ft long. The power cord has an 115V plug, but this can be cut off and the system can be wired to 115/230VAC. The power supply will automatically switch to 115V or 230V.
 - b. 8511DC Control Module – Main power cord is approximately 10ft long and has alligator clamps that are designed to connect to a mobile equipment battery (car/truck battery).
 - c. The 8512 pump module has a 10ft long cable that is wired to the 8512 control module.
 - d. The 8512 pump module includes 20 feet each of inlet tubing (1/2" OD), and outlet tubing (3/8 OD). Using chemical lines longer than 20 feet will result in reduced performance. The chemical reservoir and injection point at irrigation line must accommodate the 20ft of inlet and outlet tubing. Tubing can be shortened.

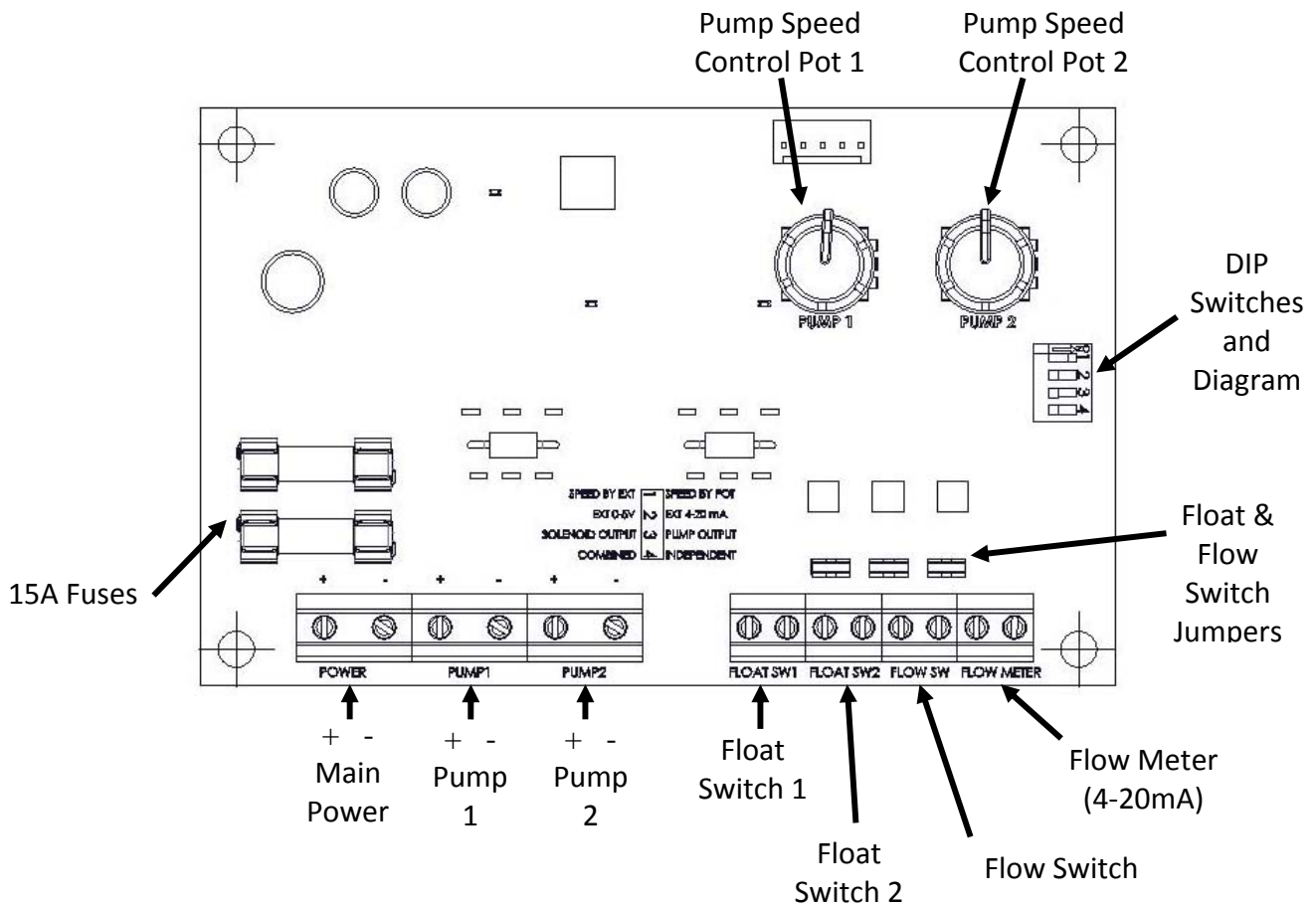
- e. The 8512 pump module chemical tube inlet should be mounted no more than five feet above the bottom of the chemical tank to ensure proper chemical draw.
2. Connect the 8512 pump module cable to the control module.
 - a. Route the cable through one of the cord strain reliefs at the bottom of the 8511 control module.
 - b. Use the Pump Output 1 on control board for pump 1, and if using a second pump, Output 2 on control board for pump 2. Black to negative, white to positive.
 - c. Pull a couple inches of the pump cable into the control enclosure to remove the stress of the electrical connection to the control board. Tighten the nut on the strain relief to secure the pump cable.
3. Install the pump pickup tubing between the chemical reservoir and the pump inlet. The pickup tubing is 3/8" ID with a strainer fitted at one end. The end with the strainer will be installed at the chemical reservoir.
 - a. Connect the 3/8" barb x 1/2" stem fitting (85.134.1) to the pump inlet by pushing it on to the 1/2" push-on fitting at pump inlet (left side).
 - b. Slip the hose clamp (76.2.13) over the end of the 3/8" ID pickup tubing without the strainer.
 - c. Slide the tubing on to the barb fitting and tighten the hose clamp to secure the chemical pickup tubing to pump inlet.
 - i. The 1/2" Push-on x 1/2" stem right angle fitting (85.133.2) can be added to direct the tubing connection at a right angle if necessary. The right angle fitting may be helpful when there is limited space around the pump module.
 - d. Route and secure the tubing to the chemical reservoir. Use tie wraps to secure the tubing. To assure optimum pumping performance the chemical inlet tubing must not exceed 20 feet (tubing can be shortened). The tubing should be secured so the strainer is resting on the bottom of the chemical reservoir.
4. Install the pump discharge tubing between the pump outlet and the irrigation line. The discharge tubing is 3/8" OD tubing.
 - a. Connect the discharge tubing to the outlet connection (right side) of the pump module by pushing it into the 3/8" push-on fitting at the pump outlet.
 - i. The 3/8" Push-on x 3/8" stem right angle fitting (85.133.1) can be added to direct the tubing at a right angle if necessary. The right angle fitting may be helpful when there is limited space around the pump module.
 - b. Route the tubing to the irrigation line injection point. To assure optimum pumping performance the chemical discharge tubing should not exceed 20ft (tubing can be shortened).
 - c. Connect the discharge tubing to the irrigation line using the quill fitting (85.127.1).
 - i. The quill fitting has a 1/2" male tapered pipe thread. It may be necessary to use a pipe bushing/adaptor to accommodate the 1/2" pipe thread (see Quill Fitting Diagram C).
5. Connect the optional 85.128.1 analog flow meter in line with the discharge tubing.
 - a. The flow meter must be mounted vertically.
 - b. Simply cut the discharge tubing at the desired location.
 - c. Mount the flow meter vertically using the 1/2" mounting clamps (85.125.1).
 - d. Connect the end of the tubing from pump to the flow meter by pushing the tubing into the 3/8" push-on fitting at the bottom/inlet of the flow meter.

- e. Connect the end of the tubing that is going to the quill inlet fitting by pushing the tubing into the 3/8" push-on fitting at the top/outlet of the flow meter.
6. Install the chemical reservoir float switch.
 - a. Route the float switch cable through one of the cord strain reliefs at the bottom of the 8511 control module.
 - b. Wire the float switch to the control board at float switch input 1 for the pump 1 and float switch input 2 for pump 2. Each terminal for the float switch should have a wire connected. Wires can be connected to either terminal (no polarity required).
 - c. Enable the float switch function by removing the float switch jumper. The jumper can hang on one of the pins so that it is not misplaced.
 - d. Route the float switch and cable to the chemical reservoir. Secure using tie wraps.
 - e. Install the float switch in the chemical reservoir using the instructions that are included with the float switch.
 - f. It is good practice to test the float switch for proper operation.
 - i. Pump should run when liquid in chemical reservoir is above the pickup tube strainer.
 - ii. Pump should not run when the liquid in chemical reservoir is at or below the pickup tube strainer.

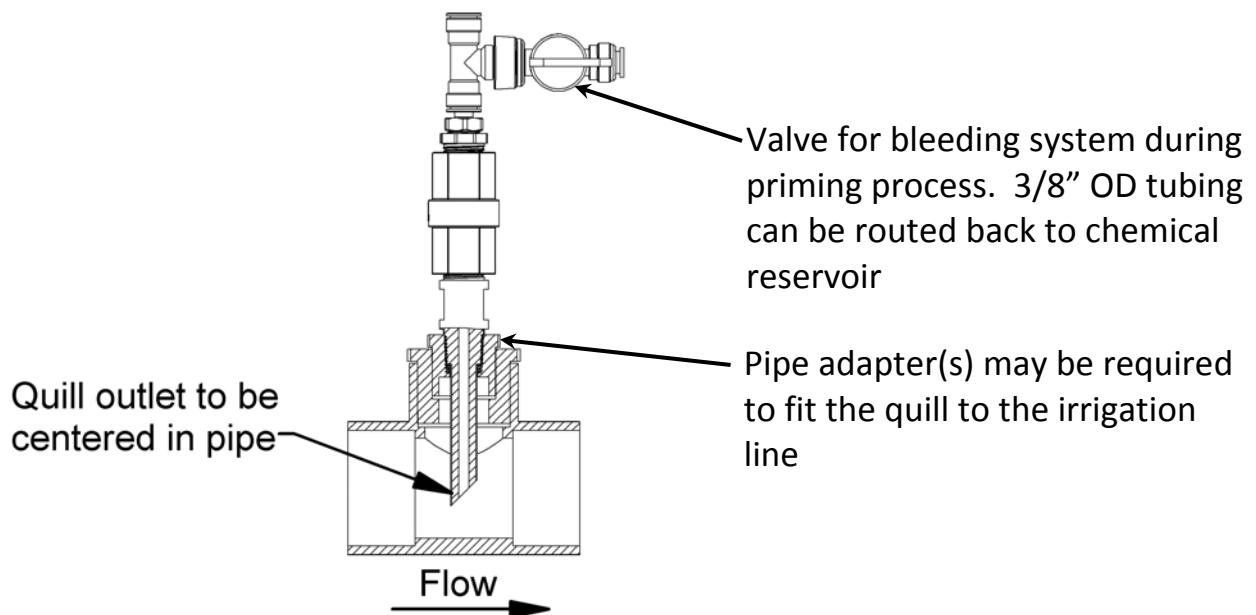
Installation Layout Diagram A



Control Board Diagram B



Quill Installation Diagram C



Optional Equipment

Flow Switch – A flow switch can be added to detect if water is flowing through the irrigation line. This would be used to start or stop the Easy Dose based on irrigation line flow. DEMA DOES NOT OFFER A FLOW SWITCH and the flow switch will need to be ordered from an irrigation or plumbing component supplier.

1. The flow switch needs to be “normally open”. This means that when water is flowing through the irrigation line, the switch will close and enable the Easy Dose to operate.
2. The flow switch needs to be installed upstream from the chemical injection point (quill).
3. Install a cord strain relief (85.109.1) and backing nut (58.400.2) to the bottom of the control panel (both parts are supplied in the control module kit pack).
 - a. Remove one of the hole plugs in the bottom of the control enclosure.
 - b. Install the cord strain relief through the hole. The cord strain relief should be installed on the outside of the control enclosure. The nut is used to clamp the cord strain relief inside the control module enclosure.
 - c. Route the wiring of the flow switch through the strain relief cord grip.
 - d. Connect the flow switch wiring to the “flow switch input” terminals. No polarity is required.
 - e. Remove the flow switch input jumper from the two pins and hang on one pin to store the jumper. Keeping the jumper on two pins will not allow for proper flow switch operation.
 - f. Pull a 2 to 3 extra inches of the flow switch wiring into the control enclosure and tighten cord grip to secure the wiring.

Flow Meter – An electronic flow meter can be added to detect the flow rate of the irrigation line. The electronic flow meter will automatically control the chemical injection rate based on water flow through the irrigation line. DEMA DOES NOT OFFER AN ELECTRONIC FLOW METER and the flow meter will need to be ordered from an irrigation or plumbing component supplier. The electronic flow meter must include a 4-20mA output signal for connection to the Easy Dose.

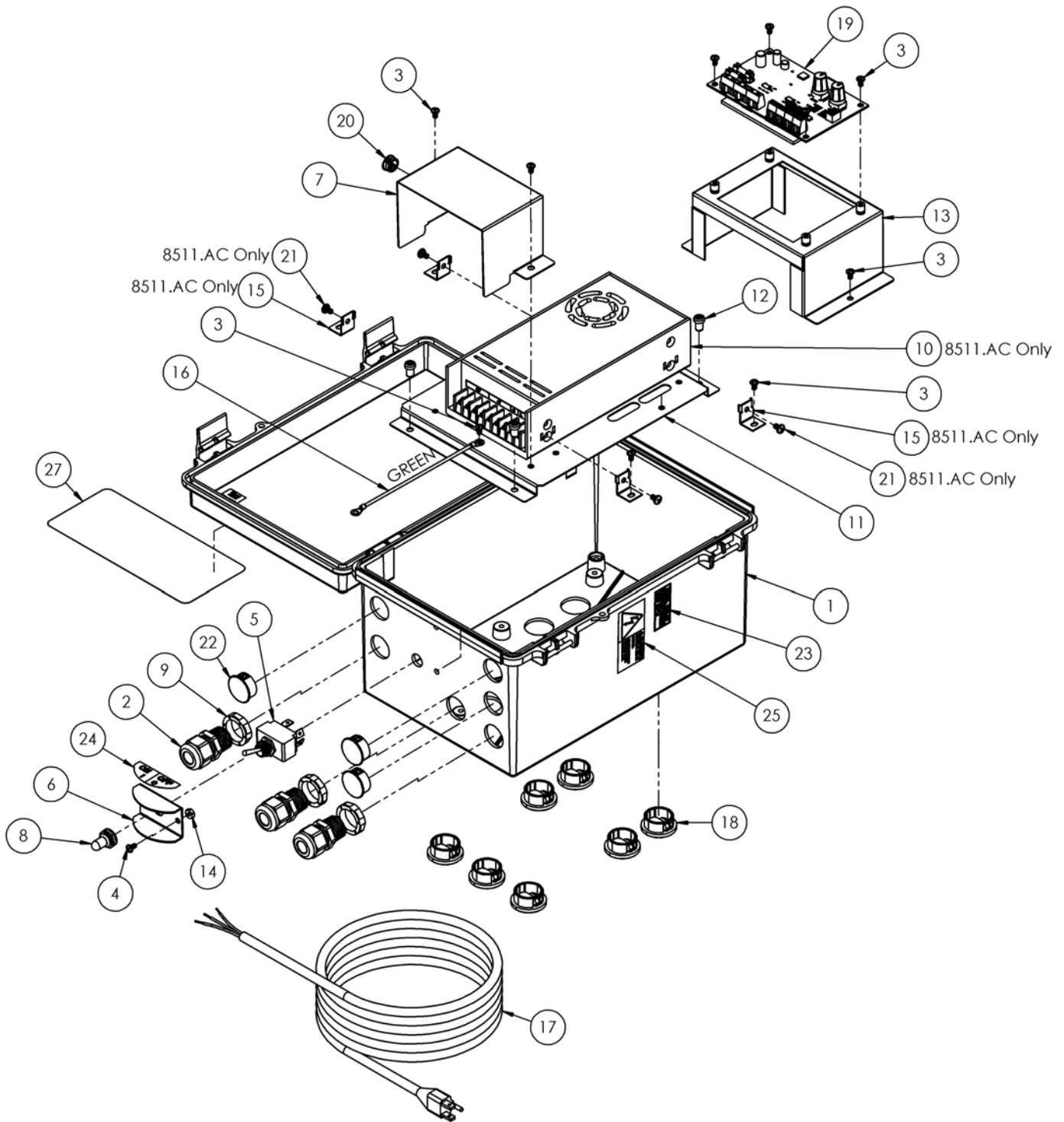
1. Refer to electronic flow meter instruction guide for proper installation and wiring.
2. DIP switch 1 must be moved to “Speed By Ext”
3. DIP switch 2 must be moved to “4-20mA”

Programming, Setup & Operation

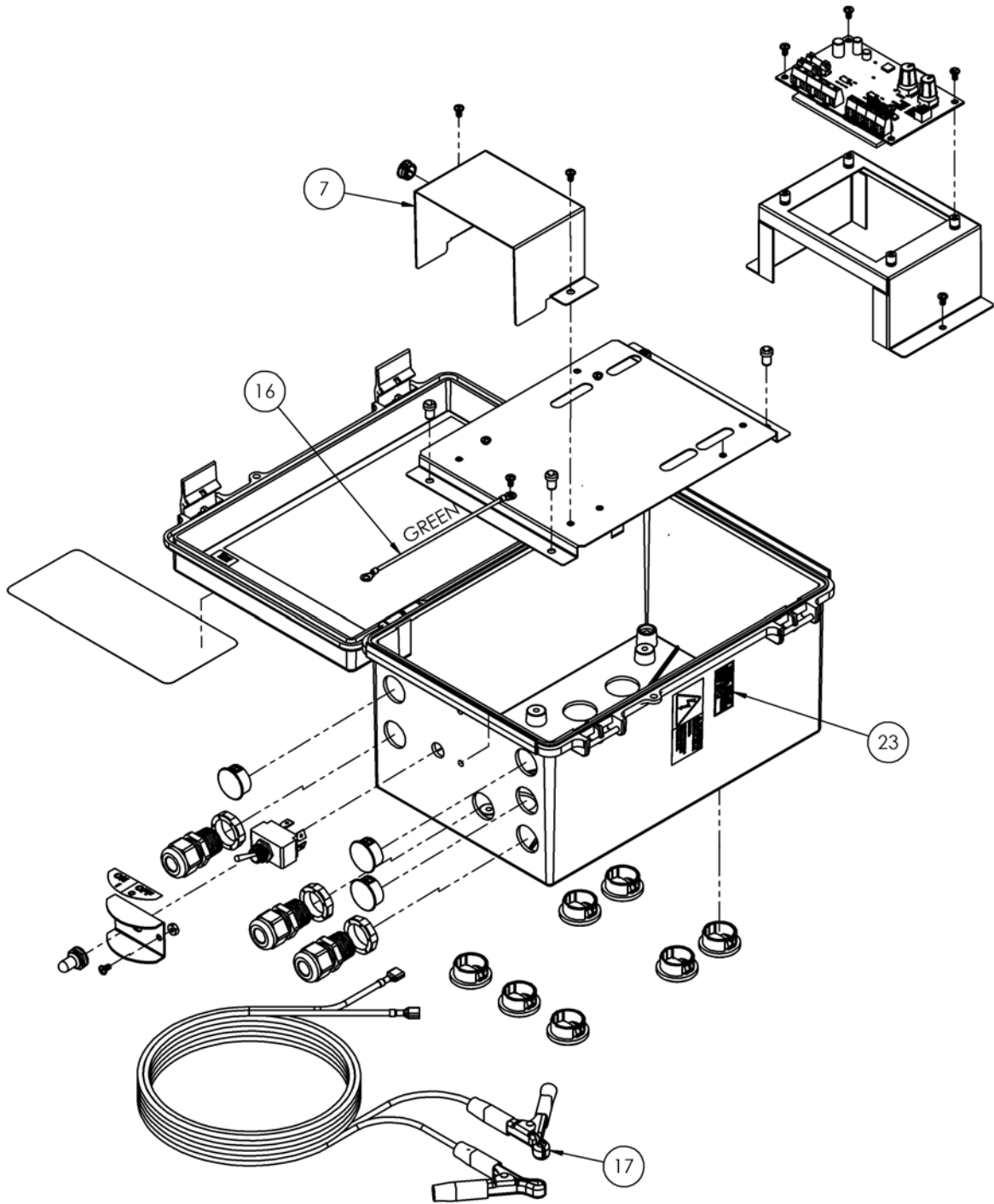
1. DIP Switches should be set as follows for typical application when not using electronic flow meter technology.
 - a. DIP 1 = set to “Speed by Pot”
 - b. DIP 2 = either setting will work
 - c. DIP 3 = set to “Pump Output”
 - d. DIP 4 = independent (float switch for each pump) or combined (one float switch controls both pumps).
 - i. DIP 4 is for when 2 pumps are being used in the application
2. Fill the chemical reservoir with the appropriate chemical/water mixture.
3. Turn the power switch for Easy Dose to the “on” position.
4. Prime the chemical pickup and discharge lines.
 - a. To assure the best performance assure that the chemical lines are primed all the way to the quill injection point.
 - b. The bleed valve at the quill will need to be opened to release air if the irrigation line is pressurized.
5. With water running through the irrigation line, adjust the speed control knob to obtain the correct injection amount.
 - a. If using the analog flow meter, observe the flow rate.
 - b. If not using the analog flow meter, refer to table below for an approximate injection rate.

Control Setting	Approximate Flow Rate (GPM) with Water Thin Chemical							
	OPEN	10 PSI	20 PSI	30 PSI	40 PSI	50 PSI	60 PSI	70 PSI
100	1.8	1.7	1.5	1.4	1.3	1.2	1.1	0.8
90	1.7	1.6	1.4	1.3	1.2	1.1	0.1	0.7
80	1.6	1.4	1.2	1.2	1.1	1	0.9	0.6
70	1.4	1.3	1.1	1.1	1	0.9	0.8	0.5
60	1.3	1.2	1	0.9	0.9	0.8	0.7	0.3
50	1.1	1	0.8	0.7	0.7	0.6	0.5	0.1
40	0.9	0.7	0.6	0.5	0.4	0.3	0.2	-
30	0.6	0.5	0.4	0.3	0.2	0.1	-	-
20	0.3	0.1	-	-	-	-	-	-
10	0.1	-	-	-	-	-	-	-

Replacement Parts

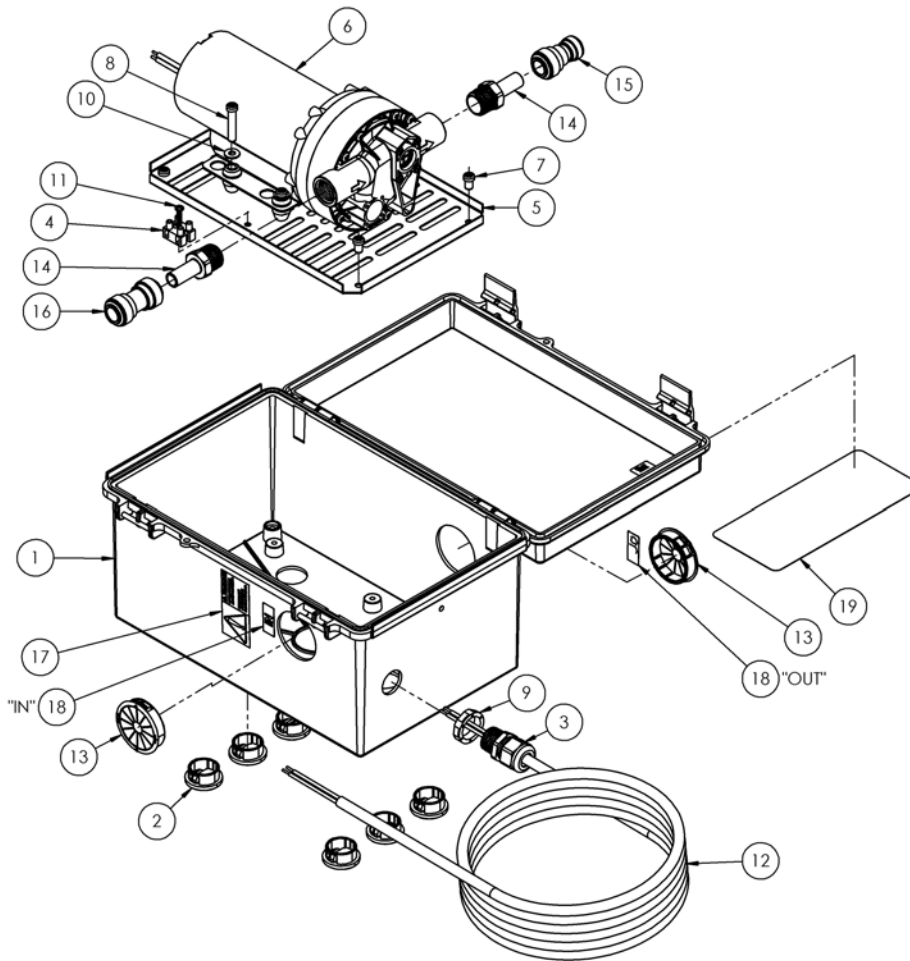


8511AC & 8511DC Models – See 8511 Easy Dose Replacement Parts Table on Page 11
 (Some components for the 8511DC model are shown on next page)



8511 DC Model – See 8511 Easy Dose Replacement Parts Table on Page 11

8511 Easy Dose Replacement Parts		
Item No.	DEMA Kit No.	Description
1	85.105.1	Enclosure
2	85.109.1	Cord Grip Liquid Tight
3	41.40.3	#6-32 x 1/4" Screw
4	41.40.4	#6-32 x 5/8" Screw
5	83.11.2	Toggle Switch
6	85.111.1	Toggle Switch Guard
7	85.112.1	Switch Cover (8511.AC Only)
	85.136.1	Switch Cover (8511.DC Only)
8	40.476.1	Toggle Switch Boot
9	58.400.2	1/2" NPT Nylon Nut
10	85.106.1	Power Supply 12VDC 25A (8511.AC Only)
11	85.107.1	Power Supply Mounting Bracket
12	25.85.1	10-32 x 3/8" Screw
13	85.108.1	Control Board Bracket
14	84.32.1	#6-32 Hex Nut
15	85.123.1	Power Supply Bracket Clip (8511.AC Only)
16	85.124.1	Wire Kit (8511.AC Only)
	85.137.1	Wire Kit (8511.DC Only)
17	25.128.6	Power Cord (8511.AC Only)
	85.135.1	Power Cable (8511.DC Only)
18	85.110.1	Vented Plug 1"
19	85.104.1	Control Board
20	61.14	Snap Bushing
21	32.2.2	M4 x 6mm Screw (8511.AC Only)
22	85.138.1	Hole plug 0.875"
23	L1762	Electrical Rating Label (8511.AC Only)
	L1763	Electrical Rating Label (8511.DC Only)
24	L1701	On-Off label
25	L897	Electrical Caution label
26	L1702	Inner Door Label
27	L1704	Front Door Label



8512 Pump Easy Dose Replacement Parts		
Item No.	DEMA Kit No.	Description
1	85.113.1	Enclosure
2	85.110.1	Vented Plug 1"
3	85.109.1	Cord Grip Liquid Tight
4	85.139.2	Barrier Strip - 2 Position
5	85.115.1	Pump Mounting Bracket
6	85.114.1	Pump 12VDC 1.2 GPM @ 60 PSI
7	25.85.1	#10-32 X 3/8" Screw
8	25.85.6	#10-32 X 1-1/4" Screw
9	58.400.2	1/2" NPT Nylon Nut
10	98.110.1	#10 Flat Washer
11	41.40.4	#6-32 X 5/8" Screw
12	85.120.1	Cable
13	25.124.8	Universal Bushing 1-3/4"
14	58.132.2	JG Stem Fitting 1/2" X 1/2" M-NPT
15	81.182.6	Quick Connect Fitting 1/2" X 3/8" JG
16	81.182.4	Quick Connect Fitting 1/2" X 1/2" JG
17	L898	Chemical Caution Label
18	L1703	In/Out Label
19	L1704	Front Door Label

Warranty

Merchandise Returns

No Merchandise will be Returned for Credit Without DEMA'S Written Permission. Returned Merchandise Authorization Number is Required in Advance of Return.

Product Warranty

DEMA products are warranted against defective material and workmanship under normal use and service for one year from the date of manufacture. This limited warranty does not apply to any products that have a normal life shorter than one year or failure and damage caused by chemicals, corrosion, physical abuse, or misapplication. Rubber and synthetic rubber parts such as "o"-rings, diaphragms, PVC tubing, and gaskets are considered expendable and are not covered under warranty. This warranty is extended only to the original buyer of DEMA products. If products are altered or repaired without prior approval of DEMA, this warranty is void.

Defective units or parts should be returned to the factory with transportation prepaid. If inspection shows them to be defective, they will be repaired or replaced without charge, F.O.B. factory. DEMA assumes no liability for damages. Return merchandise authorization number must be granted in advance of returned units for repair or replacement (See "Merchandise Returns" above).