



MKR-5000C Series Foam Marker Owner's Manual

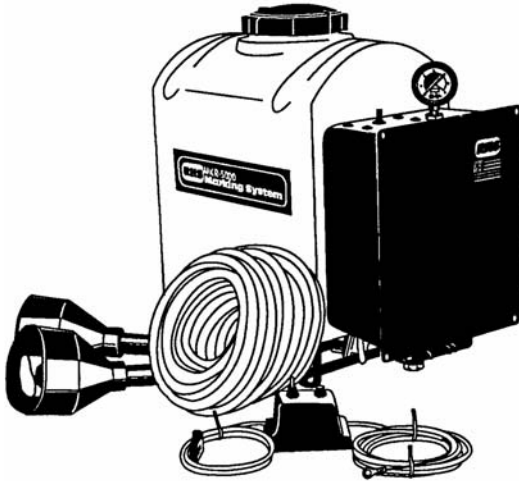
P/N: DOM-MK004, rev. D

Congratulations on your purchase of a Bestway Foam Marker. This manual is designed to help you install and operate your new marker properly. All the information you need to get up and running should be here. All units are operated at the factory before boxing. If you have questions that simply aren't addressed in this manual, call your local dealer. Or if he is unaccessible, the factory service department will be happy to consult. Use the following number for service.

Bestway Service Department: 1-877-390-4480

(Available From U.S.A. & Canada)

MKR-5000C Series (Standard Output)



Features & Benefits

- * High Quality - Low Cost
- * Reliable FoamTube™ Design
- * Economical Operation
- * Low Electrical Current Requirement
- * Non-Pressurized Tank
- * Adjustable Foam Density
- * Fully Assembled - Easy Installation
- * Heavy Duty Foam Boots

Is The MKR-5000C For You?

This model is built especially for tractor drawn farm sprayers or other sprayers traveling less than 10 MPH. It provides enough foam to be easily seen in low crops, stubble or bare ground. It may not be quite enough in cases where travel speed exceeds 10 mph or when crops, weeds or residue exceeds 1 foot in height and marking conditions are difficult. The MKR-5000C is not capable of ribbon foam. This is the most economical marker to purchase and operate using the least electrical current. The buyer should weigh the types of conditions he expects to encounter with the relative costs.

What Is Included?

The MKR-5000C comes complete. The main unit is completely assembled with a 14 gallon tank and integral, cabinet mounted components. Two universal, heavy duty foam boots are included along with 100 feet of hose to reach from the unit to both ends of the boom. The cab control is provided with enough cable to reach 28' from the cab to the unit.

Steps For Installation

- * Mount cab control in cab.
- * Mount unit in suitable location on sprayer.
- * Install drops on ends of boom.
- * Run hoses from unit to drops and route wire to cab control.
- * Hook power cable to battery.

Options

- * 14' Electrical Harness Extension
- * Quick Detach Mounting Kit

Specifications

Tank Size.....	14 Gallons
Average Foam Output	3.2 Gallons / Minute
Average Solution Usage	4.8 Gallons / Hour
Average Drop Interval.....	7.7 Seconds
Average Drop Distance (10 MPH)	112'
FoamTube™ Design.....	Yes
Sealed Electrical Connections.....	Yes
Breaker Protection.....	Yes
Foam Boot Size	6"
Adjustable Foam Density Control	Yes
Dimensions.....	12"W x 22"L x 24"H
Weight.....	48 Lbs.
Mounting Footprint Size.....	12" x 22"

System Requirements

Voltage Requirement.....	12 - 14 Volts DC
Amperage Requirement.....	25 Amperes Max

Installation Instructions

Unpacking

Your Foam Marker has been carefully packaged to prevent damage in shipment. As you unpack, inspect all components for any signs of damage so it can be reported to the shipping carrier immediately. The box should contain the following items:

- (1) Main Marker Unit
- (1) Hardware Mounting Kit
- (2) Foam Drop Assembly
- (1) Cab Control Box
- (1) 28 ft. x 4-Pin Cable Extension
- (1) 100 ft. Roll, Clear Tubing

Note: You may find moisture in the tank or in components remaining from factory testing.

Installation

Step 1:

Find a suitable place to locate the main unit. If this is a unit with a tank, keep in mind it will weigh approximately 150 lbs. when full. Pick a position that will have a reasonably good ride, preferably on the sprayer unit itself. Mounting on the boom itself is OK if the ride is not expected to have much jolting movement.

Step 2:

Attach the main unit to a flat surface using four bolts and large flat washers over the slotted holes. Face the front cover of the black cabinet toward an open area so that maintenance and service can be easily performed. The pressure gauge on top of the cabinet should be situated for easy viewing while adjusting the knob, also located on top of the cabinet. If this unit does not include the tank, a steel framework is provided on the back of the black cabinet for mounting purposes. It's important to mount the cabinet vertically so the pressure gauge is on the top side.

Step 3:

On the end of each boom, mount the two foam drops. You can use either the 3" hose clamps provided, or improvise your own mounting design. The operation of the foam marker is optimized when used with these foam drops. The hose used on the drop is very flexible and tough in case the boom drags close to the ground.

Step 4:

After the boom drops are in place, connect the 1/2" hose to the drops. Run each length of hose to the Directo-Valve on the bottom of the cabinet. Attach the left side to Outlet #2, and the right side to Outlet #1. Secure the hose to the boom using the tie straps provided. If you are installing a one-side discharge model, no Directo-Valve will be installed. In this case attach the hose to the hose barb protruding from under the cabinet.

Directo-Valve Assignments

Right Side <---> Outlet #1

Left Side <---> Outlet #2

Step 5:

Install the Cab Control in a convenient place close to the operator seat. You may use either the Velcro patches provided or replace the box screws with longer ones for a bolted mount. Connect the power leads to a good source of 12 volt power. If you are not attaching the power leads directly to the battery, make certain the wires feeding your hookup location are at least 12 gauge. It is not necessary to provide a circuit breaker, since the breaker is provided on the MKR control.

WARNING!

MAKE ABSOLUTELY CERTAIN YOU ARE CONNECTING **RED** TO POSITIVE AND **BLACK** TO NEGATIVE WHILE ATTACHING POWER LEADS. DAMAGE CAN OCCUR TO UNIT WITH LEADS REVERSED.

Step 6:

Extend the 28', four-wire extension cable back to the foam unit. If you need additional cable, call your dealer for more. DO NOT ATTEMPT TO MAKE YOUR OWN EXTENSION! Plug in the large black Packard connector and the unit is ready to operate.

Solution Preparation

Selecting A Concentrate

Always use high quality foam concentrate. We recommend BESTWAY DuraFoam 160™ for all general purpose marking. Be aware that a lot of poor quality foam concentrate is sold every year to unsuspecting customers. Some concentrates may work well in some circumstances and not others, so be careful.

Mixing The Solution

Always add concentrate to water and not water to concentrate. When topping off a tank of mix with a water hose, place the end of the hose under the surface so as not to agitate the solution causing the tank to fill up with foam. Always follow label directions.

CAUTION!

MIXING THE SOLUTION TOO STRONG WITH SOME CONCENTRATES MAY MAKE THE FOAM TOO STIFF. THE MARKER WILL APPEAR TO BE STALLING WITH VERY LITTLE COMING OUT, BUT THE FOAM QUALITY WILL LOOK GOOD. TRY DILUTING THE MIX WITH WATER.

DuraFoam 160™ Mix Bottle

A specially made DuraFoam 160™ Mix Bottle has been designed to help mix the solution. It has the water calibration printed on the side. For example, if you need enough concentrate for 8 gallons of water, just fill to the 8 gallon mark and pour it in. It also features 3 scales, a standard mix, a high-stress mix, and a ribbon-foam mix. The BESTWAY mix bottles are available from your dealer.

BESTWAY Water Conditioner

BESTWAY also offers a water conditioner if your water has a high mineral content. If the foam appears watery, it may need more concentrate or a water conditioner. With some experimentation, you will easily find the right mix.

Operation

The Cab Control

To operate, turn the switch either left or right depending on which side you want the foam to go. The unit operates 100% either way. The only difference is the position the Directo-Valve is set. A resettable circuit breaker is also on the cab control in case a prolonged high current condition exists.

Setting The Pressure

The liquid pressure is adjusted using the knob on top of the cabinet, not far from the pressure gauge. This is used to adjust the relative mixture of air and water. The marker actually injects the liquid under pressure into the air to make foam. This gauge is indicating the pressure at which the liquid is being injected. (More pressure, more liquid)

When the knob is turned fully counter-clockwise, the pump is shut completely off. By rotating the knob clockwise, the pump will speed up and the pressure will rise. Speed the pump to 100% to aid in priming on the first tank fill.

Normally, you should operate the pressure between 20 to 40 PSI. Operating under 20 PSI will often result in intermittent foam because there simply isn't enough liquid pressure to overcome the foam discharge pressure. Operating over 40 PSI will use excessive solution and will create a very wet foam. (You might like this in very hot, dry conditions). Never operate the unit continuously over 60 PSI.

Pressure Setting Characteristic Chart

	Low Pressure	High Pressure
Pressure Range	20 to 30 PSI	30 PSI and up
Foam Density	Light	Heavy
Foam Consistency	Fluffy, Larger Bubbles	Thick, Smaller Bubbles
Solution Usage	Lower	Higher
Average Blob Size	Larger	Smaller
Hot Weather Durability	Less	More

Maintenance

Cleaning

The air pump filter should be inspected and cleaned weekly in normal running conditions. Clean more often if conditions are very dusty. Otherwise, clean as often as experience dictates. It's also a good idea to use an air hose to blow out the cabinet and air pump motor cavity after each 50 hours of operation. (Again, more often in very dusty conditions).

Try to keep dirt and debris out of the tank at all times. The marker is protected by a large 80 Mesh strainer under the tank and by a 100 Mesh strainer in the line ahead of the liquid orifice. These may need cleaning periodically, depending on operator cleanliness.

Winterization & Storage

To prepare the marker for storage, perform the following steps. When finished, all plumbing and wetted parts will be filled with liquid RV antifreeze. This is preferred over dry storage.

- X Drain the tank by removing the strainer bowl.
- X Clean and replace strainer bowl.
- X Fill with one gallon of RV antifreeze.
- X Operate normally through both sides for two minutes each.
- X Using air hose, blow cabinet out clean.
- X Clean filter on air pump.
- X Protect unplugged connectors from weather.

Trouble Shooting

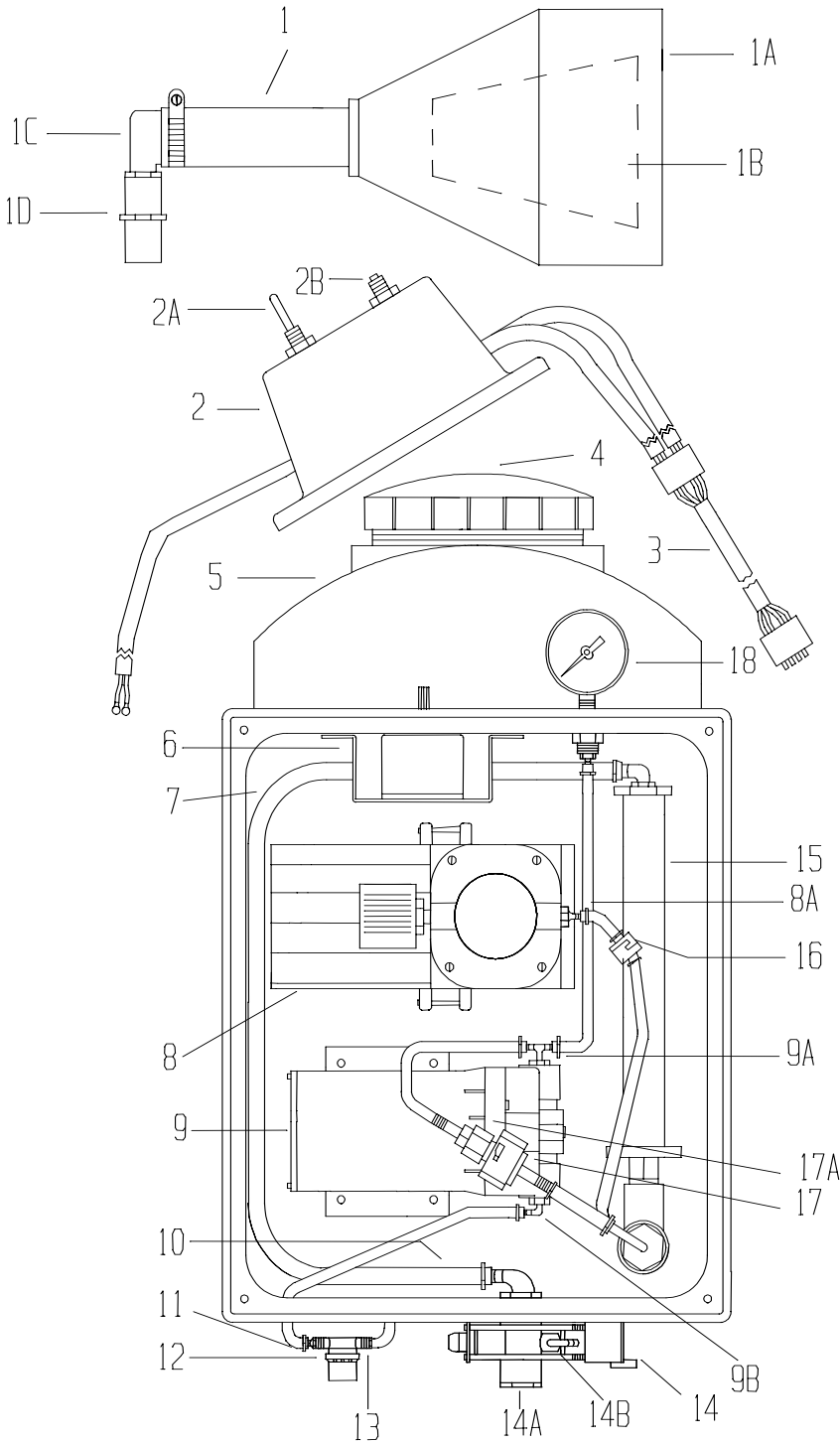
How It Works

The foam marker works by pumping air through the FoamTube™ on its way to the boom. Liquid is injected through an orifice into the air stream just prior to entering the foam mixing tube. A directional valve (on two sided models) then diverts the foam either left or right. That's all there is to it!

Problem Solving Chart

Problem	Possible Cause	Solution
Marker Doesn't Run At All	Harness plug not plugged in or Circuit breaker popped.	Check all wiring plugs and connections. Check breaker and reset if necessary.
Air Pump Runs - Nothing Coming Out - No Pressure On Gauge	Liquid pump shut off or not primed. (Hint: When working on liquid pump, it is helpful to unplug the air pump so you can hear the liquid pump running)	Turn liquid control knob clockwise as far as it will go. This will run the pump at full speed to aid in priming. Allow a minute or two to prime. If it still won't, find the liquid orifice assembly near the discharge of the pump and uncouple briefly to allow air pressure to be relieved. If it still doesn't prime, either the tank strainer/outlet is completely plugged or the pump needs service or replacement.
	Electronic speed control failed causing liquid pump not to run. (Hint: When working on liquid pump, it is helpful to unplug the air pump so you can hear the liquid pump running)	Check this component by feeling and listening to the motor while you turn the knob up and down. If it speeds up and slows down, the control and pump motor are OK. If not, unplug the liquid pump from the speed control. Using jumper wires, apply 12 Volts DC directly to the liquid pump. It should run full speed indicating the pump is OK and the Speed Control is not working. Check polarity of wires to power supply. If you're absolutely sure it is correct, replace the electronic speed control.
	Liquid pump valves or diaphragm have failed.	If the liquid pump appears to run normally as described above, but can't prime or pump the liquid, it may need a new diaphragm, or valve cartridge. We suggest replacing both.
	Liquid pump motor failed.	If you've determined in the above step the liquid pump did not work when 12 Volts was applied, replace pump motor or whole pump.
Nothing Coming Out - High Pressure Showing	Liquid Orifice Plugged	Find liquid orifice assembly near outlet of liquid pump. Unplug orifice, clean orifice strainer.
Discharge Almost All Water	Air pump not running.	This is easy to tell by listening and feeling the motor housing. Motor needs service, could be brushes.
	Air pump diaphragm ruptured, worn out, or valves failed.	Check output by uncoupling the air check valve near the air pump discharge port. Stop the output with your finger. Pressure should build and labor the pump. If not, pump needs to be overhauled or replaced.
	Air pump discharge plugged.	Inspect air check valve located near the pump discharge for proper operation. Also, check valve cartridge can be installed backwards.
	Liquid metering orifice missing.	The orifice plate is small and can inadvertently be lost while uncoupling the assembly.
Discharge Foamy But Very Watery	Concentrate weak or water too hard.	Strengthen concentrate mixture or add water conditioner. If this doesn't work, try a different water supply.
	Liquid pressure too high.	Reduce liquid pressure to under 30 psi.
	Air pump not operating or plugged.	See air pump remedies above.
Good Foam - Not Enough Of It	Foam solution mixed too strong.	Measure the output by catching in a bucket. If output exceeds 3 GPM, the marker is working at full capacity. If not, try diluting the mixture a little. Make sure foam quality is good as described above.
Foam Goes To Wrong Side	L - R hoses hooked up backwards or no power to the valve.	Reverse hoses on Directo-Valve or check electrical connection to the valve.
Foam Goes To Both Sides	Directo-Valve not adjusted properly.	1. Unscrew jam nut, and unscrew armature stop; 2. Push in on lower piston with pointed object until it stops; 3. While holding piston in, turn armature stop in until it just makes contact.; 4. Back out 1/8 turn and lock with jam nut.

MKR-5000C Parts



Item	P/N	Description
1	AA120	Complete Boot Assembly
1A	ST000	Boot Only
1B	SJ000	Bag Only
1C	EL-3410PP	Elbow Barb
1D	FC-34	Coupling
2	AA116	Cab Control
2A	CB-DPDT	Toggle Switch
2B	CB-BKR25	Breaker, 25 Amp
3	AA121	Wiring Ext., 14'
3	AA127	Wiring Ext., 28'
4	TLS-6SL	Tank Lid, 6"
5	10437-A	Tank, 14 Gallon
6	AA485	Speed Control (Serial # C2000 and later)
7	VR12	Tubing, 1/2"
8	AA114	Air Pump Assembly
<p>Note: Includes the complete air pump assembly with hose barbs and electrical plug-in installed. Common parts for the air pump are as follows.</p>		
	MKR-AF	Air Filter
	608148	Diaphragm
	621102	Reed Valve (2 req.)
	627093	Brushes
8A	EL-1814	Elbow Barb
9	AA122	Liquid Pump Assembly
<p>Note: Complete assembly with hose barbs and electrical plug in. Common parts for the liquid pump are as follows.</p>		
	SHU9439506	Diaphragm Kit, Santoprene
	SHU9439107	Bypass Valve Kit, 60 psi, Viton
9A	TP-3814	Tee Barb
9B	EL-3814	Elbow Barb
10	EL-3412PP	Elbow Barb
11	A-14	Straight Barb
12	3350-0082A	Strainer, 80 Mesh
	3800-0047	80 Mesh Screen
	3351-0020	Strainer Bowl
	1700-0090	Strainer Gasket
13	SE-12PP	Street El
14	AA123	Directo-Valve Assembly
<p>Note: This valve includes the fittings that are attached directly to it. For a valve only, order a 144-1-3.</p>		
	AB144-1-3	Valve Repair Kit, 144-1-3
14A	F-34PP	Plug
14B	EL-12PP	Elbow Barb
15	AA330	FoamTube™ Assy
16	MKR-CHK14	Check Valve, Air
17	AA357	Check Valve Assy
17A	4916-27	Orifice Plate, #27
	4193A-PP2-100SS	Check Strainer, 100 Mesh
	18999-R	Seat Gasket
18	GF60	Pressure Gauge

Parts Not Shown

FO005	Cabinet Lid (BESTWAY)
AA366SS	Stainless Steel Tank Skid

MKR-5000C Wiring Diagram

