



MKR-5000D Series Foam Marker Owner's Manual

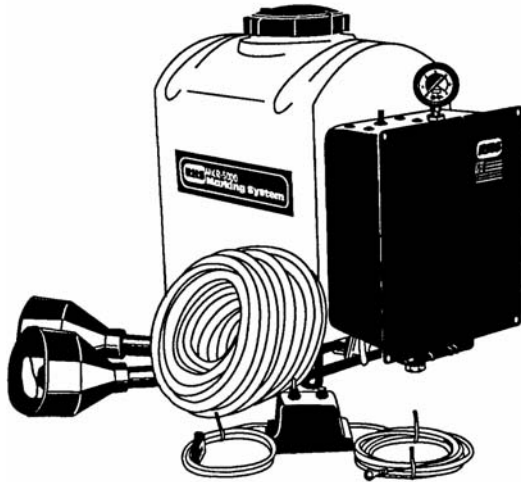
P/N: DOM-MK005, rev. C

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 inaccessible, 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-5000D (High Output)



Features & Benefits

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

Is The MKR-5000D For You?

This model is for difficult marking conditions at slower speeds or normal marking conditions at high speeds (over 10 MPH). Performance in no-till, maximum residue fields and standing crops will be excellent unless conditions are extreme. RibbonFoam™ is possible with the MKR-5000D, but results may or may not be adequate based on the particular field condition. The MKR-5000D is a good combination of high performance and economy.

What Is Included?

This marker comes complete. The main unit is completely assembled with a 14 gallon tank and integral, cabinet mounted components. Two 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
- * RibbonFoam™ Fittings Kit

Specifications

Tank Size	14 Gallons
Average Foam Output	5.2 Gallons / Minute
Average Solution Usage	6.8 Gallons / Hour
Average Drop Interval	4.9 Seconds
Average Drop Distance (10 MPH)	72'
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
Mounting Footprint	12" x 22"
Weight	48 Lbs.

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 3/4" 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, avoid agitating the tank to keep the tank from filling up with foam. Always follow label directions.

DuraFoam 160™ Mix Bottle

You can obtain a specially made DuraFoam 160™ Mix Bottle 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 liquid 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 operating conditions. More often in very dusty conditions. 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. (Or 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.

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

Trouble Shooting

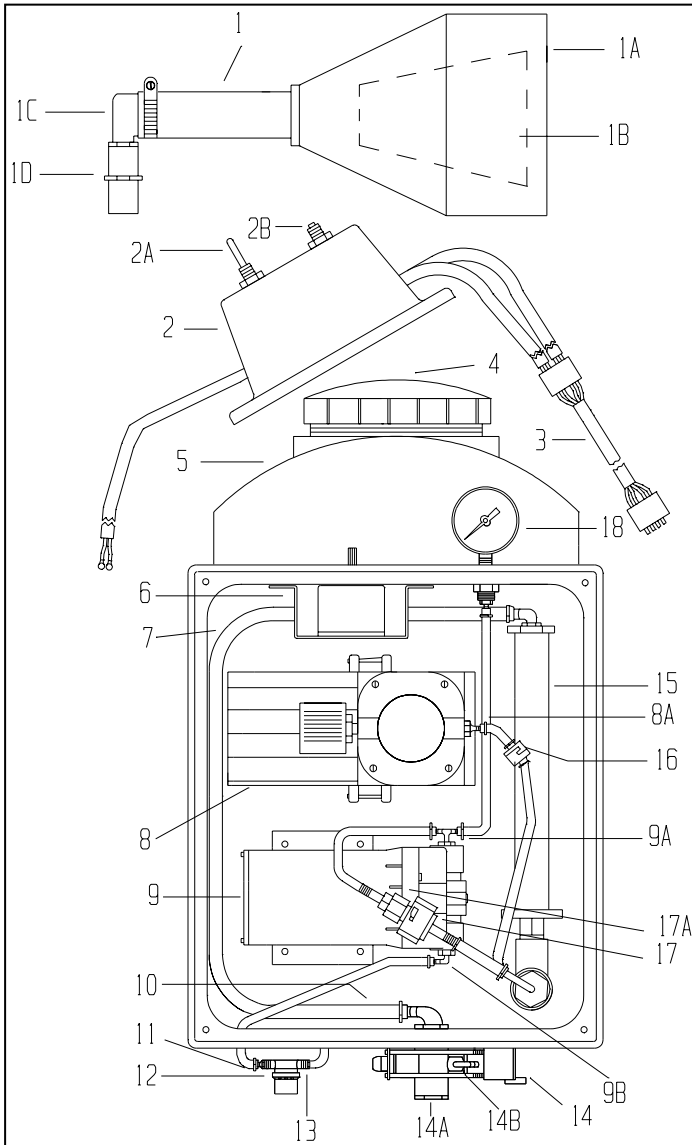
How It Works

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 piston damaged, 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.
Not Enough Foam	Poor foam quality or weak air pump performance.	Measure the output by catching in a bucket. If output exceeds 5 GPM, the marker is working at full capacity. Follow steps above to improve foam quality and inspect air pump for proper performance.
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-5000D Parts



Item P/N Description

- 1 AA120 Complete Boot Assembly
- 1A ST000 Boot Only
- 1B SJ000 Bag Only
- 1C EL-3410PP 3/4" x 1" Elbow Barb
- 1D FC-34 3/4" 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"
- 4 4-TLA-5T-LID Tank Lid, 6" (Willmar)
- 5 10437-A Tank, 14 Gallon
- 5 ACE001 Tank, 19 Gallon (Willmar)
- 6 AA485 Speed Control
- 7 VR34 Tubing, 3/4"
- 8 AA427 Air Pump Assembly

Note: Includes the complete air pump assembly with hose barbs and electrical plug-in installed. Common parts for the air pump are as follows.

- MKR-RK415 Air Pump Repair Kit
- 60001 Air Filter
- 654831 Intake Reed Valve
- 621102 Exhaust Reed Valve
- 627076 Brush Set
- 8A EL-14 Barb, 1/4mpt x1/4Barb

9 AA122 Liquid Pump Assembly
Note: Complete assembly with hose barbs and electrical plug in.

Common parts for the liquid pump are as follows.

- 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 AA429 Directo-Valve Assembly

Note: This valve includes the fittings that are attached directly to it.

For a valve only, order a 144-1-3.

- AB144-1-3 Valve Repair Kit, 144-1-3
- 14A F-34PP Plug
- 14B EL-1234PP Elbow Barb
- 15 AA425 FoamTube™ Assy
- 16 MKR-CHK14 Check Valve, Air
- 17 AA358 Check Valve Assy
- 17A 4916-34 Orifice Plate, #34
- 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
- AA532 Steel Skid (Willmar, Hagie)

MKR-5000D Wiring Diagram

