MARUYAMA
The Very Best

ELECTRIC SPRAYER

MODEL MS 027 M

- COMPACT, LIGHTWEIGHT DESIGN — CONVENIENT GRIP.
- VERSATILE, ALL-PURPOSE SPRAYER WITH ADJUSTABLE SPRAY WAND.
- PRESSURE REGULATOR FOR SETTING DISCHARGE RATES
- DURABLE, HIGH PRESSURE PISTON PUMP
- QUIET, HEAVY DUTY ELECTRIC MOTOR.

<table>
<thead>
<tr>
<th>Item / Model</th>
<th>MS 027 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUMP TYPE</td>
<td>SINGLE PISTON</td>
</tr>
<tr>
<td>DISCHARGE - MAX</td>
<td>0.58 gpm</td>
</tr>
<tr>
<td>PRESSURE - MAX</td>
<td>500 psi</td>
</tr>
<tr>
<td>ELECTRIC MOTOR</td>
<td>115 VOLT, 60 hz</td>
</tr>
<tr>
<td>HOSE</td>
<td>32 FEET</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>19 lbs.</td>
</tr>
<tr>
<td>LxWxH</td>
<td>9.4 in. x 9.3 in. x 8.3 in.</td>
</tr>
</tbody>
</table>

INCLUDES INLET HOSE & FILTER, BYPASS HOSE.

Quality Equipment Since 1895
MARUYAMA U.S., Inc./15436 N.E. 95th St., Redmond, WA 98052/P.O. Box 2167, Redmond, WA 98073/(206)885-0811/FAX(206) 885-0123
WARNING

Heavy Duty Sprayer
Model: MS-O

- Use only 110-115 volt electrical outlets.
- Use only 3-pronged grounded extension cords and receptacle boxes.
- Keep all electrical connections away from liquids.
- Clean after every use with warm soapy water and then rinse with clean water.
- Wear protective clothing; respirator, hood, gloves and boots when mixing and spraying chemicals.
- Do not spray into the wind. Avoid the drift of solution sprays.
- Do not direct the spray or spray gun at yourself or anyone else.
- Be certain all hoses and connections are secure prior to using the Heavy Duty Sprayer.
- Avoid dry operation, since the spray solution acts as a pump lubrication.
- Relieve the pressure before removing the hoses or spray gun.
- Apply all chemicals according to EPA Guidelines.
- Store in a clean, dry location—away from children and unauthorized personnel.
- Remove all hoses and drain the pump prior to storage.
- Do not drag the hoses over sharp objects or bend excessively.
- Repair or replace all damaged or broken hoses before using the Heavy Duty Sprayer.
- Before servicing the unit, disconnect the Heavy Duty Sprayer from the power source.
- Do not store mixed chemicals. Use all of the chemical mixture immediately.
- Do not adjust the P.R.V. (Pressure Regulator Valve) over 500 PSI. The maximum operating pressure for the Heavy Duty Sprayer, model MS-O is 500 PSI.
Assembly & Preparation

1. Install the suction hose (red – inlet), bypass hose (clear – outlet), discharge hose, and the spray gun. Use Teflon® tape on the discharge hose threads that connect to the spray gun. Make sure that the packings are not damaged or missing from the suction hose. Tighten all connections securely.

2. Loosen the Pressure Regulator Valve (P.R.V.) by rotating the large red knob on the pump housing counterclockwise. This lifts the spring tension off of the check valve, and allows all of the spray solution to bypass back into the chemical tank via the overflow hose.

3. Inspect the suction hose strainer for any debris that may have clogged the screen mesh.

4. Place the suction hose and overflow hose into the chemical tank.

5. Be sure the “ON/OFF” toggle switch is in the “OFF” position (DOWN).

6. Be sure the sprayer is placed on a level surface for operation so it is not likely to fall. The Heavy Duty Sprayer will vibrate, causing it to move about. Place the sprayer on the ground, floor or bolt it securely to the MS-12 Cart.

7. Connect the power cord to a suitable 110-115 V 60 HZ receptacle. Notice that the pilot lamp will be illuminated.

**NOTE:** If an extension cord is going to be used with the Heavy Duty Sprayer, the maximum length should be no longer than 100 feet (12 gauge, grounded).

**CAUTION:** Keep all electrical connections away from liquids. Use only three-pronged grounded receptacles and extension cords.

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1. P.R.V. Lock
2. Pressure Regulator Valve (P.R.V.)
3. Pilot Lamp
4. ON/OFF Toggle Switch
5. Reset Switch
6. Power Cord
7. Suction Hose Strainer
8. By-Pass Hose (clear)
9. Spray Gun
10. Discharge Hose
11. Pump Body
12. Suction Hose (red)
Operation

1. After completing Assembly and Preparation flip the “ON/OFF” toggle switch to “ON” (UP).

2. Wait for the spray solution to return to the chemical tank through the overflow hose. Be sure all air bubbles are eliminated from the overflow hose.

**NOTE:** Spray solution preparation is very important. When using any detergents, wetting agents or chemicals, follow the labeled instructions on the product container. Mix the product thoroughly with water before spraying.

3. In case the spray solution does not return to the chemical tank through the overflow hose, check the following:

   A.) Make sure that the suction hose packing is not damaged or missing. Tighten the suction hose securely.

   B.) The suction valve may be stuck closed. Push the suction valve open with a small rod (remove suction hose first). **Figure B.**

   C.) If these remedies do not work, pour a small amount of water down the suction hose (inlet) to prime the pump.

   D.) Avoid dry operation as the spray solution also acts as a lubricant for the pump.

   E.) Do not allow spray solution to contact the motor or pump.

4. Slowly increase the operating pressure by turning the P.R.V. clockwise. This increases the tension on the check valve.

5. Open the spray gun by rotating the handle on the gun. As the handle is rotated, the spray pattern changes from a fine mist to a concentrated stream. Adjust the operating pressure as necessary while spraying.

6. When the spray solution has been emptied from the chemical tank close the spray gun and turn the machine “OFF”. Avoid dry operation as the spray solution also acts as a lubricant for the pump.

7. Rotate the P.R.V. counterclockwise to release tension on the check valve.

8. If there is spray solution remaining and you wish to stop spraying for a short time, lift the suction hose and overflow hose out of the chemical tank and flip the “ON/OFF” toggle switch to “OFF” when all spray solution has been emptied into the chemical tank from the overflow hose.

![Figure B](image)

Cleaning & Storage

1. Flush the pump and discharge hose with warm soapy water for a few minutes. This will clean the pump and discharge hose.

2. Unplug the electrical cord. Make sure the electrical cord is not damaged in any way.

3. Wipe off the motor and pump housing with a damp cloth so it is clean for the next operation.

4. Store the Heavy Duty Sprayer in a clean, dry, dust-free area. Protect the motor from moisture with a plastic covering.

**CAUTION:** Do not store the Heavy Duty Sprayer in areas where freezing temperatures may occur.
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sprayer will not turn on. Pilot lamp does not illuminate.</td>
<td>• Sprayer is not plugged in.</td>
<td>• Plug sprayer into a 110-115 volt electrical outlet.</td>
</tr>
<tr>
<td></td>
<td>• Pressure is too high for motor capacity.</td>
<td>• Reduce the pressure setting. Turn the Pressure Regulator Valve counterclockwise.</td>
</tr>
<tr>
<td></td>
<td>• Defective electric motor.</td>
<td>• Have the electric motor serviced by a qualified electrician or contact the Dramm Corporation Service Department at 900-258-0848.</td>
</tr>
<tr>
<td>• Sprayer pump will not draw up solution.</td>
<td>• Suction hose is not securely fastened to the pump or the suction hose packing is damaged.</td>
<td>• Tighten the suction hose coupling to the pump or replace the hose packing.</td>
</tr>
<tr>
<td></td>
<td>• Suction valve is stuck to suction valve seat.</td>
<td>• Remove the suction hose and push the suction valve open with a small rod.</td>
</tr>
<tr>
<td></td>
<td>• Dry operation has pressurized the pump cylinder with air.</td>
<td>• Remove the discharge hose to eliminate air from the pump.</td>
</tr>
<tr>
<td></td>
<td>• Suction hose strainer is clogged.</td>
<td>• Clean the strainer screen thoroughly. Replace if necessary.</td>
</tr>
<tr>
<td>• No pressure.</td>
<td>• P.R.V. is defective or damaged.</td>
<td>• Overhaul; replace valve and valve seat.</td>
</tr>
<tr>
<td></td>
<td>• No spray solution returns through the overflow hose.</td>
<td>• Replace spray gun nozzle orifice disk.</td>
</tr>
<tr>
<td></td>
<td>• Clogged nozzle (poor spray pattern).</td>
<td>• Clean nozzle thoroughly.</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>• Gradual pressure reduction with no recovery.</td>
<td>• Clogged suction hose or strainer.</td>
<td>• Clean strainer screen thoroughly and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>• P.R.V. is defective or damaged.</td>
<td>• Repair of replace Pressure Regulator Valve.</td>
</tr>
<tr>
<td>• Solution is leaking from the pump assembly.</td>
<td>• Damaged U-packing, part #512010015 (item #15 on the parts diagram).</td>
<td>• Replace damaged U-packings.</td>
</tr>
<tr>
<td>• Unstable pressure. Suction hose and discharge hose vibrate significantly.</td>
<td>• Air is being drawn into the pump.</td>
<td>• Tighten suction hose securely to the pump and check packing.</td>
</tr>
<tr>
<td></td>
<td>• Valves and valve seats are stuck together.</td>
<td>• Check suction valve and discharge valve for damage. Clean or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>• P.R.V. and valve seat are damaged.</td>
<td>• Replace damaged parts.</td>
</tr>
<tr>
<td>REF</td>
<td>PART #</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>-----</td>
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<tr>
<td>1</td>
<td>573808</td>
<td>DISCHARGE PART</td>
</tr>
<tr>
<td>2</td>
<td>573809</td>
<td>BUSHING (LARGE)</td>
</tr>
<tr>
<td>3</td>
<td>573810</td>
<td>PLUNGER</td>
</tr>
<tr>
<td>4</td>
<td>573811</td>
<td>PIN</td>
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<td>5</td>
<td>573812</td>
<td>BOLT (4.0mm X 4mm)</td>
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<tr>
<td>6</td>
<td>573813</td>
<td>SPRING</td>
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<tr>
<td>7</td>
<td>573814</td>
<td>DISCHARGE VALVE</td>
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<tr>
<td>8</td>
<td>573815</td>
<td>PISTON</td>
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<tr>
<td>9</td>
<td>573816</td>
<td>PISTON PACKING</td>
</tr>
<tr>
<td>10</td>
<td>573817</td>
<td>U-NUT (6.0mm)</td>
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<td>11</td>
<td>573818</td>
<td>GUIDE RING</td>
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<td>BUSHING (SMALL)</td>
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<tr>
<td>13</td>
<td>573820</td>
<td>O-RING (S-28)</td>
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<tr>
<td>14</td>
<td>573821</td>
<td>SPACER</td>
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<td>573822</td>
<td>U-PACKING</td>
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<td>573823</td>
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<td>O-RING</td>
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<td>SUCTION VALVE</td>
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<td>19</td>
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<td>SUCTION VALVE SEAT</td>
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<td>573827</td>
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<td>21</td>
<td>573828</td>
<td>U-NUT (5.0)</td>
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<td>STUD BOLT (8.0mm X60mm)</td>
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<td>BLIND NUT (8.0mmX 6.0mm)</td>
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<td>ECCENTRIC COLLAR</td>
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<td>CONNECTING ROD</td>
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<td>28</td>
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<td>BALL BEARING(6005ZZ)</td>
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<td>573836</td>
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<td>SPRING WASHER (8.0mm)</td>
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<td>DISCHARGE FITTING</td>
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<td>BOLT (LONG-8.0mmX40mm)</td>
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<td>P.R. VALVE SEAT</td>
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<td>573851</td>
<td>PUMP COVER</td>
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<td>STRAINER</td>
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<td>81-84</td>
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<td>BY-PASS HOSE</td>
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<td>MOTOR ASSEMBLY</td>
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<td>573857</td>
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<td>573858</td>
<td>SWITCH CAP</td>
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<td>573859</td>
<td>PILOT LAMP</td>
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<td>66-70</td>
<td>573860</td>
<td>BUFFER ASSEMBLY</td>
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</table>
PART #    DESCRIPTION
582418    MINI NOZZLE
582422    HOOD CAP
582421    NOZZLE SEAT
582420    PACKING
582419    NOZZLE SEATPLATE
582423    BODY ASS'Y (6-12)
582829    ADJUSTING ROD
582830    O-ING
582831    GLAND
582832    NUT
582833    GRIP
582834    O-ING
582835    SWIVEL JOINT