

MADDEN MANUFACTURING, INC.

START UP PROTOCOL

DIAPHRAGM METERING PUMPS

1. Inspection and mounting

Your pump has been inspected and performance tested at the factory. Visually inspect the pump to make sure there has been no shipping damage. If there has been damage, do not operate the pump. Contact the factory or the local sales representative. If the pump is not damaged mount the pump with bolts securely to a firm foundation that will support the weight of the pump and attached piping, and that will withstand operating vibrations.

2. Wiring

Have an electrician check the electrical power wiring to the motor to make sure the wiring is properly installed per the motor wiring diagram. Make sure there is adequate electrical power supply for the motor and that electrical safety controls are installed.

3. Piping

Inspect piping installation for these items:

- a. Correct size and materials for piping. Also confirm that the pump application is the same as when the pump was ordered, and that the wetted end materials of the pump construction are suitable for the liquid being pumped.
- b. Suction and discharge piping installed in proper connection on the pump: suction connection is on the bottom and the discharge connection is on the top. Place a pipe union, or removeable hose fitting, close to each connection.
- c. **WARNING! Piping loads in excess of 5 lbs in any direction may cause valve gaskets to leak liquid, or to suck air, causing the pump to fail to prime and operate properly.**
- d. Accessory fittings are installed as required. Accessories required may include any of the following items: pressure relief valve, back pressure valve, suction side filter and valves, pulsation dampener, foot valve with filter, calibration column, leak detector switch or leak containment for double diaphragm type pumps.

4. Lubrication

Your Madden pump comes from the factory filled to the proper level with lubrication. If you notice oil leakage in the shipping carton or on the pump that occurred in shipping you may check to make sure the pump has adequate lubrication. To do that remove the top Allen head screw on the back of the gear case. Lubrication should be filled to the level of this screw and should start to run out if the pump is gently moved or slightly tipped. If the oil level is low carefully loosen the nameplate (p/n MP049) by removing the four screws. Do not disturb the flexible shaft (p/n MP048). Move the nameplate to the side, and refill with the proper lubrication to the level of the gear case screw. Replace the Allen head screw and nameplate.

5. Leaks

Your pump was pressure tested at the factory for leaks. After the pump is installed check the pump and piping for leaks by pumping water or other inert liquid through the system under pressure or by using compressed air. **WARNING: DO NOT OPERATE THE PUMP AGAINST A DEAD HEAD.** Tighten all leaking connections. Check the pump solution head bolts and valve cap flange bolts for tightness. Tighten pump bolts if they are not tight. **CAUTION, OVER TIGHTENING THE BOLTS COULD CAUSE DAMAGE AS THREADS MAY BECOME STRIPPED.** During the first six weeks of pump operation check the tightness of the solution head bolts once a week and tighten as required to prevent leakage. The rubber diaphragm will creep due to the pump action and that can cause leaks if the bolts are not checked and tightened periodically.

6. Calibration

Your pump operators manual will give you the approximate output range of your pump with water. However, you will need to calibrate your pump and prepare a calibration curve in order to know the exact output rate of your pump at various stroke length and motor speed settings (for those pumps with variable speed motors). When the pump is shipped from the factory the output adjustment dial is set at 100. **CAUTION: ONLY CHANGE THE STROKE KNOB SETTING ON THE PUMP WHEN THE PUMP MOTOR IS OPERATING. TURNING THE KNOB WHEN THE MOTOR IS NOT OPERATING CAN DAMAGE THE FLEXIBLE SHAFT (P/N MP048).** Measure the amount of liquid flowing through the pump by using a calibration column or supply tank with volume markings. Determine the amount of liquid being pumped over a short period of time (usually 1 minute) at various stroke settings. Record your data and plot a calibration curve showing output at the various stroke settings.

7. Repairs and service

Set up a file folder for your pump to include the operating manual and parts list. Record the pump model number and serial number. If the invoice for the pump is available include it as it may have other useful data. Read the operators manual and parts list and follow the instructions. Obtain a list of recommended spares for the pump and keep the spares in stock for future use. Set up a preventive maintenance inspection and service schedule and keep a record of the service in the file.

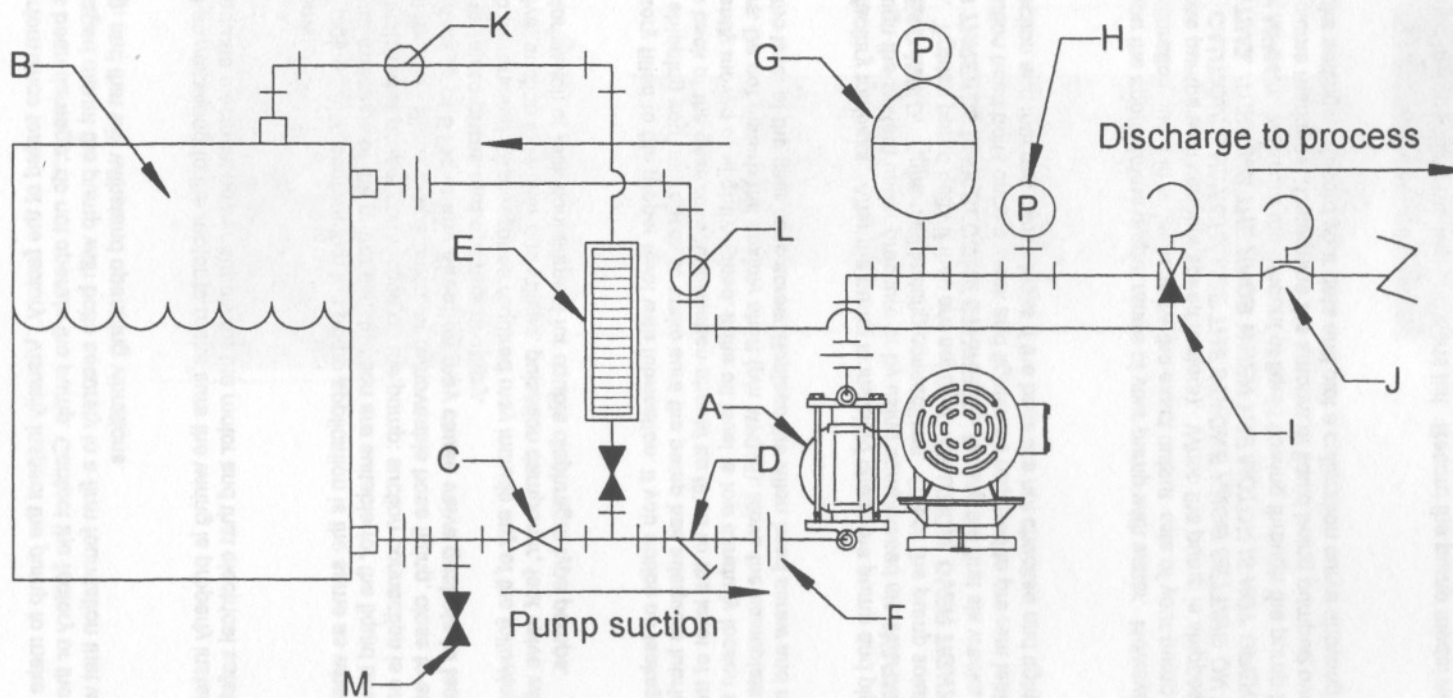
8. Help line

If questions or problems occur during the set up or operation of your Madden pump contact your local sales representative or the Madden factory for assistance: Phone: 574-295-4292 from 7:30 am - 4:00 pm EST, FAX: 574-295-7562, email: info@maddenmfg.com and Website: www.maddenmfg.com.

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- A. Diaphragm metering pump
- B. Tank
- C. Control valve
- D. Strainer
- E. Calibration column
- F. Union for piping installation to pump
- G. Pulsation dampener, chargeable type

- H. Pressure gauge
- I. Pressure relief valve, adjustable, diaphragm type
- J. Back pressure valve, adjustable, diaphragm type
- K. Vent line from calibration column
- L. Return line to tank from pressure relief valve
- M. Tank drain



TYPICAL METERING PUMP INSTALLATION DIAGRAM

See Form No. M-316, Start Up Protocol, for installation instructions. Note, not all of the piping accessories shown above may be required.