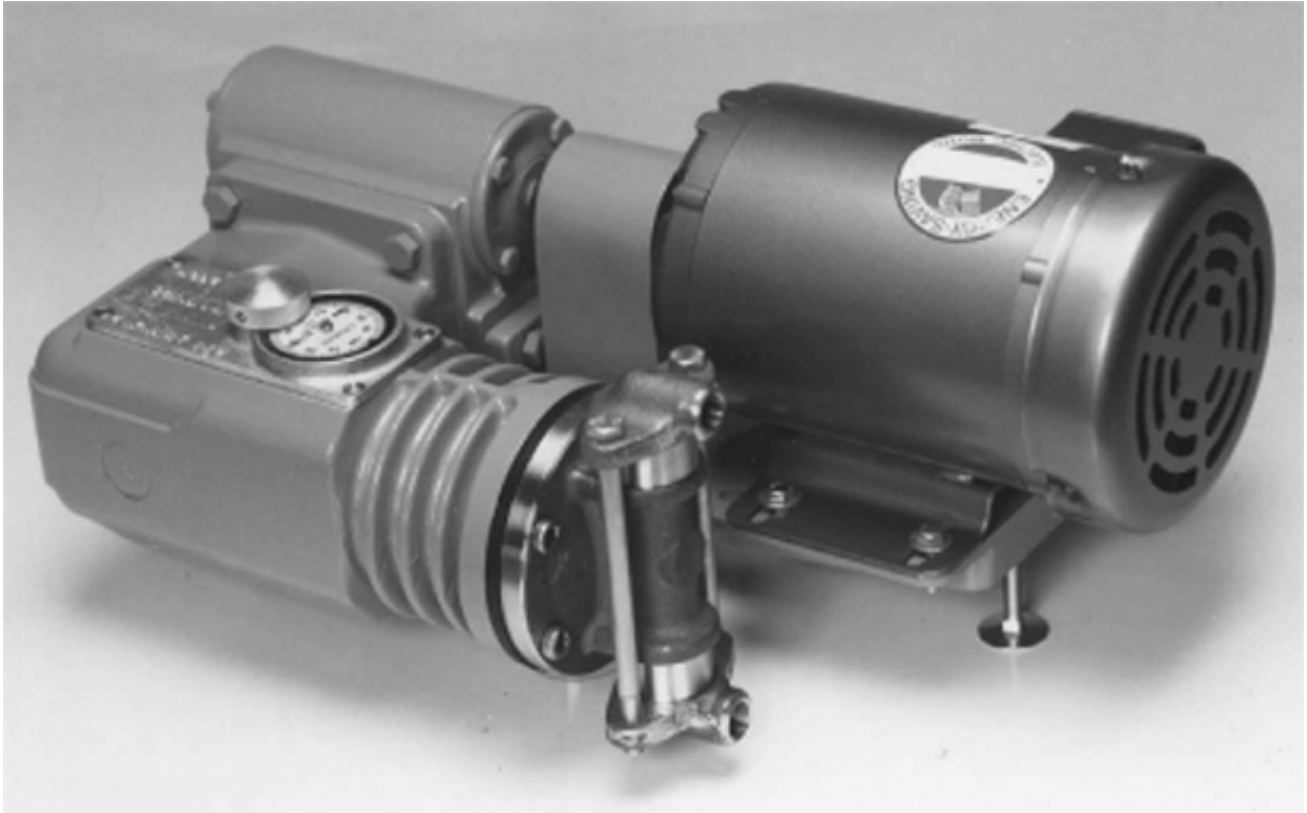


# MADDEN MF Series Diaphragm Metering Pumps

Accurate, Dependable Metering Pumps for Liquid Chemicals

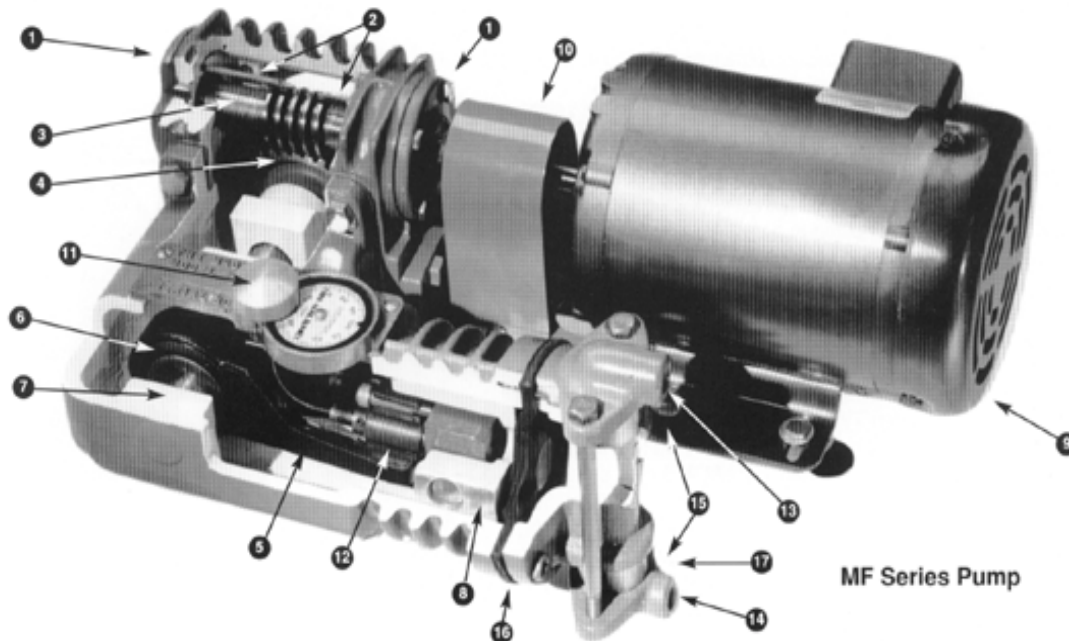


These simple, rugged, accurate pumps are used in many industrial plants for injecting a controlled flow of highly reactive liquids such as acids, caustics and water treatment chemicals. Heavy duty industrial grade construction means these tough pumps will deliver many years of trouble free 24-7-365 pumping.

- ✓ MF Series pumps are designed for  $\pm 1\%$  steady state repeatable accuracy over a 10:1 turndown range.
- ✓ Manual output control knob is located on top of the pump for easy access.
- ✓ Automatic pump output control is available for pumps equipped with a variable speed motor, such as the Franklin Type IMDS motor. (See type F catalog sheet)
- ✓ Industrial grade worm gear reducer is integral with the pumping mechanism. Precision internal pump parts run in an oil bath for extended service life. No external lubrication required.
- ✓ Double diaphragm option is available for superior protection from dangerous liquids.
- ✓ When equipped with the proper materials the MF Series pumps are excellent for pumping dangerous liquids such as acids, caustics and solvents. Liquids with suspended solids such as diatomaceous earth and lime slurry can be accurately pumped.
- ✓ Standard motors are industrial grade 1/4 to 3/4 HP 56 frame, foot mounted TEFC. Motors are available for explosion proof, washdown, and mill & chem plant duty, and for 1 or 3 phase, 50 or 60 Hz power.
- ✓ Tough fabric reinforced rubber diaphragms protect the drive train from the pumped liquid. The short stroke with 3" diameter piston increases diaphragm life by reducing fatigue.
- ✓ See the cutaway photo for details of the internal pump construction features

# MF SERIES DIAPHRAGM METERING PUMPS

## CONSTRUCTION FEATURES - MF SERIES



MF Series Pump

1. **Bearing Cap** - containing self-oiled tapered roller bearing.
2. **Oil Feed Tubes** - provides continuous supply of oil to bearings.
3. **Drive Shaft** - made from alloy steel, integral precision machined worm drive gear.
4. **Worm Wheel Gear** - made from extra heavy cast bronze, machined to exacting tolerances.
5. **Connecting Rod** - rugged, over-sized casting provides extra large bearing surfaces. Minimum wear - longer life!
6. **Eccentric** - extra large (1-7/8" diameter x 1-1/4" face) precision ground and hardened.
7. **1" Drive Shaft** - ground & polished, supported by 2 out-board and 2 in-board bronze bushings for extra rigid alignment.
8. **Piston** - 3" diameter x 3" long provides extremely large bearing surface. Floating in oil and moving with a short stroke for minimum wear.
9. **Motor** - premium quality with ball bearings and foot mount. Available in any closure or voltage. Standard motor is 1 or 3 phase, 1725 r.p.m., 48 or 56 frame TEFC. See page 5
10. **Flexible Coupling and Coupling Guard** - meets ASME B15.1 safety standard.
11. **"Micro-Control" volume adjustment.** The Stroke Adjustment knob and Dial Scale are conveniently located on the top of the pump. The Dial Scale is divided into one hundred calibrations. For quick, accurate adjustments, it is geared directly to the knob which also controls the piston movement via a flexible cable. *Adjustment is made only while the pump is running!*
12. **Stroke Length Adjusting Screw** - provides "lost motion" type volume adjustment.
13. **Outlet Piping Connection** - 3/8", 1/2" or 3/4" NPT Valve Cap.
14. **Inlet Piping Connection** - 3/8", 1/2" or 3/4" NPT Valve Cap.
15. **Check Valve - Inlet and Outlet Ball Type.** See page 3 for details.
16. **Diaphragm** - Heavy duty fabric reinforced, double diaphragm also available. See page 3 for details.
17. **Solution Head** - Vertical mounting assures clearance of entrained air & helps maintain agitation while minimizing precipitation of solids. With the diaphragm acting as a tough, flexible barrier, all working parts of the pump are protected from the fluid being pumped. See page 4 for construction materials available.
18. **Durable acrylic enamel finish** - for protection from environment. For superior corrosion resistance, an optional epoxy/polyurethane finish is available.

NOTE: MH Series Pump construction is identical to the MF Series shown above, except the MH Series uses a larger 4-1/2" diameter steel piston.

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# MF SERIES DIAPHRAGM METERING PUMPS

Pump Models and Wetted End Materials

## MF Series Pumps, Simplex (one pumping head)

Model No.	Output range GPH	Output range L/hr	Max pressure psi/bar	Piping connection	Motor HP/kw	Stroke speed, 1,725 rpm motor
MF105A	0.5-5	1.9-18.9	300/21.1	3/8" NPT	1/3/.25	29 spm
MF110A	1-10	3.8-37.8	150/10.6	3/8" NPT	1/3/.25	29 spm
MF110C	1-10	3.8-37.8	300/21.1	3/8" NPT	1/2/.37	29 spm
MF118A	1.8-18	6.8-68	150/10.6	3/8" NPT	1/3/.25	58 spm
MF118C	1.8-18	6.8-68	300/21.1	3/8" NPT	1/2/.37	58 spm
MF136A	3.6-36	13.6-136	150/10.6	3/8" NPT	1/3/.25	115 spm
MF136C	3.6-36	13.6-136	300/21.1	3/8" NPT	1/2/.37	115 spm
MF160A	6-60	22.7-227	80/5.6	3/8" NPT	1/3/.25	172 spm
MF160C	6-60	22.7-227	160/11.2	3/8" NPT	1/2/.37	172 spm
MF160D	6-60	22.7-227	250/17.6	3/8" NPT	3/4/.56	172 spm
MF190C	7.5-75	28-280	35/2.5	3/4" NPT	1/2/.37	172 spm

## MF Series Pumps, Duplex (two pumping heads)

Model No.	Output range GPH per head	Output range L/hr per head	Max pressure psi/bar	Piping connection	Motor HP/kw	Stroke speed, 1,725 rpm motor
MF205A	0.5-5	1.9-18.9	300/21.1	3/8" NPT	1/3/.25	29 spm
MF210C	1-10	3.8-37.8	300/21.1	3/8" NPT	1/2/.37	29 spm
MF218C	1.8-18	6.8-68	300/21.1	3/8" NPT	1/2/.37	58 spm
MF236C	3.6-36	13.6-136	300/21.1	3/8" NPT	1/2/.37	115 spm
MF260C	6-60	22.7-227	160/11.2	3/8" NPT	1/2/.37	172 spm
MF260D	6-60	22.7-227	250/17.6	3/8" NPT	3/4/.56	172 spm
MF290C	7.5-75	28-280	35/2.5	3/4" NPT	1/2/.37	172 spm

For total output capacity when both outputs are combined multiply data above by 2.

\*\*Standard motor speed is 1725 rpm. For 1425 rpm 50 Hz motors multiply the figure given by .833. For duplex pumps with the output of both pumping heads combined multiply the figure given by 2.

### Wetted end materials to resist corrosion and abrasion

Solution head and valve bodies	Diaphragm	Backup Diaphragm	Valve balls	Valve seats
PVC	Neoprene	Neoprene	316 SS	Neoprene
Teflon	Teflon faced	Hypalon	Ceramic	Hypalon
Polypropylene	Hypalon	Viton	Hastelloy C	Viton
Cast iron/SS	Viton		Telfon	Teflon
316 SS	TFE/Viton			316 SS
Carpenter 20				

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# MF SERIES DIAPHRAGM METERING PUMPS

## Pump Specifications

SPECIFICATION: The Contractor shall furnish a diaphragm metering pump as follows: liquid to be pumped: (liquid), pumping rate: \_\_\_ GPH, at a maximum pressure: \_\_\_ PSI. The pump output will be adjustable from 0 to 100% while the pump is running using an adjustment knob located on the pump top. The pump will be of the mechanical diaphragm type with the piston directly connected to the diaphragm. Single check ball valves for both the suction and discharge connections will be included. The industrial grade gear reducer will have a bronze wheel and steel worm, and will be lubricated with an oil bath. The pump mechanism will be enclosed and running in an oil bath. No external lubrication will be required. Pump wetted end materials of construction: wetted end: \_\_\_\_\_, diaphragm: \_\_\_\_\_, replaceable valve seats: \_\_\_\_\_, double valve balls: \_\_\_\_\_, (optional: Type DDB double diaphragm will be provided for extra protection from the pumped liquid, backup diaphragm material: \_\_\_\_\_.) The piping connections will be horizontal. Size: 3/8" NPT (or optional 1/2" or 3/4" NPT vertical). The motor will be 56 frame foot mounted, connected with a flexible coupling to the gear reducer, (\_\_\_) HP, 1/60/115-230 or 3/60/230-460, 1725 rpm, TEFC. Paint finish: (manufacture's standard acrylic enamel, or optional polyurethane top coat with epoxy primer for premium corrosion resistance.) Preferred manufacturer: Madden Manufacturing, Inc., Model no. MF\_\_\_\_\_ (simplex or duplex) diaphragm metering pump, rated for (\_\_\_) gallons per hour.

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