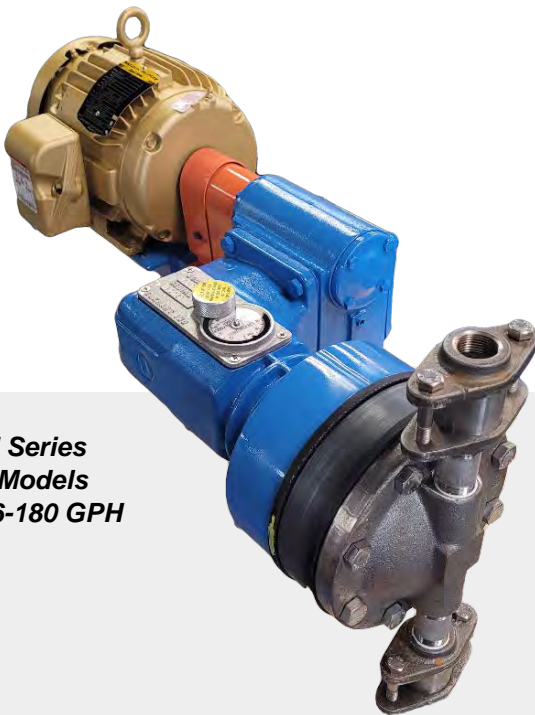


# MADDEN PUMP

## DEPENDABLE DIAPHRAGM METERING PUMPS

***SIMPLE, RUGGED, QUALITY***



***MH Series***  
• 4 Models  
• 96-180 GPH



***JN Series***  
6 Models • 1-11 GPH



***MF Series***  
5 Models • 5-60 GPH

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# MADDEN PUMPS

## Part Numbering Format

PUMP SERIES
JN
MF
MH

PUMP HEADS
1 - Simplex
2 - Duplex
3 - Triplex (JN, MF Only)
4 - Quadruplex (MF Only)

CAPACITY - GPH	
<b>JN</b>	01
	02
	03
	04
	05
	07
	11
<b>MF</b>	05
	10
	18
	36
	60
<b>MH</b>	96
	125
	150
	180

VALVE CAP SIZES
1 - 1/4" NPT
2 - 3/8" NPT
3 - 3/8" + M200 SLV
4 - 3/4" NPT
5 - 3/4" + M200 SLV
6 - CLASS 150 FLANGE
Z - CUSTOM

SOLUTION HEAD
S - 316SS
P - PVC
T - Teflon
PP - Polypropylene (MF Only)

DIAPHRAGM
N - Neoprene
H - Hypalon
V - Viton
TN - Teflon Faced Neoprene
TV - Teflon Faced Viton
TH - Teflon-Hypalon (JN Only)
E - EPDM (MF Only)

VALVE BALLS
C - Ceramic
H - Hastelloy C
S - 316SS
T - Teflon
A - Alloy 20
V - Viton (MH Only)

VALVE SEATS
T - Teflon
S - 316SS

DDB DOUBLE DIAPHRAGM
0 - No DDB
N - Neoprene
V - Viton
H - Hypalon
E - EPDM (MF Only)

MOTOR HP
0 - No Motor
A - 1/3 HP
C - 1/2 HP
D - 3/4 HP
E - 1 HP
F - 1.5 HP
G - 2 HP

MOTOR TYPE
S - Standard
X - Explosion Proof
W - Washdown Duty
M - Mill & Chemical Duty
H - 50 Hz

MOTOR PHASE
1 - Single Phase
2 - 12V DC
3 - Three Phase
4 - 90V DC

Epoxy-Poly Paint
E - Epoxy-Polyurethane <i>(Enter only if applicable)</i>

**Full P/N Example:**

<b>MF1182</b>	-	<b>SNSNN</b>	-	<b>CS1E</b>
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# Madden Diaphragm Metering Pumps

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Madden diaphragm metering pumps are designed for tough industrial jobs where chemicals must be pumped 24 hours a day, 365 days a year. Engineered materials are used for the wetted end to pump virtually any chemical, from acids to caustics. Even viscous liquids and suspended solids can be pumped with volume-controlled accuracy.

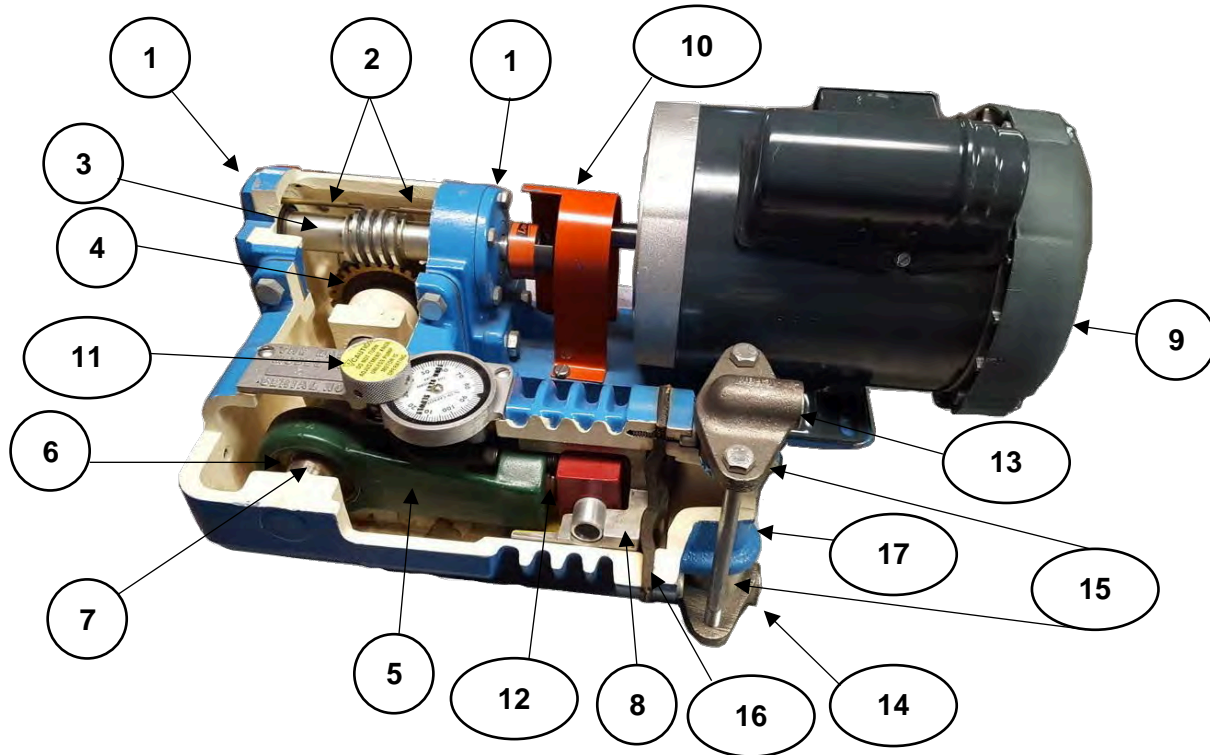
- **Accuracy**  
Repetitive accuracy of +/- 1% over a 10:1 turndown ratio is achieved with the stroke adjustment knob located conveniently on the top of the pump
- **Long Service Life, Low Maintenance**  
The simple mechanically actuated diaphragm design eliminates pesky hydraulic systems and packing glands used in many metering pumps. Large bearings and shafts, continuously lubricated with a bath of oil give many years of reliable service. Precision bronze worm gears and steel worm drive shafts convert motor rpms to linear piston pumping power. Replacing worn parts is fast and simple with common tools.
- **Three Pump Series**
  1. **JN Series:** 6 models from 1 – 11 GPH (4 - 42 L/hr), simplex, duplex, and triplex pumps available.
  2. **MF Series:** 5 models from 5 – 60 GPH (19 – 232 L/hr), simplex, duplex, triplex, and quadruplex pumps available
  3. **MH Series:** 4 models from 96 – 180 GPH (363 – 681 L/hr), simplex and duplex pumps available
- **Rugged Construction**  
Madden pumps are heavy duty industrial grade, using standard industrial 56 frame motors and worm gear reducers to produce reliable pumping power designed to provide many years of reliable service. Heavy duty aluminum gear box and pump body castings, precision machined and bolted assembly. Wetted end parts made from a selection of corrosion resistant materials. Thick nylon reinforced diaphragms for tough pumping service. Industrial grade 56 frame electrical motors are available to meet any enclosure and power supply requirements.

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## Frequently Asked Questions

1. What is the suction lift capability? Up to 10 feet, however the pumps have greater output with a flooded suction.
2. What are the viscosity limits? Madden MF and MH series pumps work well with liquids up to 450 cps (2,000 ssu) viscosity. JN series pumps are not recommended for high viscosity liquids.
3. What is the liquid temperature limit? 200 degrees F. is the limit for the pumps with metal wetted end materials. Plastic wetted end materials have limits as low as 140 degrees F.
4. Is a back pressure on the discharge side of the pump required? Yes, a minimum of 15 psi greater than the suction pressure is required to allow the ball checks to close quickly for accurate pumping.
5. How is the output adjusted? Each pump has a stroke length adjustment knob located on the top of the pump body which permits the operator to manually adjust the output from 0 to 100%. The pumps are most accurate operating in the 10 – 100% range.
6. Is automatic pump control available? Madden pumps equipped with an optional variable speed drive controller and a variable speed motor can respond to a remote 4-20 mA or other signal to change the pump output by changing the motor speed. The only limit is the minimum stroking speed of 15 strokes per minute.
7. Does the pump have a leak detector? Madden pumps equipped with the Type DDB double diaphragm construction can be equipped for either visual or electric alarm signal actuation when a diaphragm leak is detected. This is an especially important feature when hazardous liquids are being pumped to prevent damage to the pump, personnel, and the environment.

## Construction Features – MF Series



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 enclosure or voltage. Standard motor is 1 or 3 phase, 1,725 rpm, 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 only to be made while the pump is running!*
12. **Stroke Length Adjusting Screw** – provides "lost motion" type volume adjustment.
13. **Outlet Piping Connection** - 3/8" or 3/4" NPT valve cap.
14. **Inlet Piping Connection** – 3/8" 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 and 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 1:** MH Series Pump construction is identical to the MF series shown above, except for the larger 4-1/2" diameter steel piston used in MH's.

**NOTE 2:** See JN, MF, and MH cut sheets for dimensional drawings and added details.

# Madden Pump Features

## VALVES THAT CLOSE IN THE ROUGHEST SERVICE

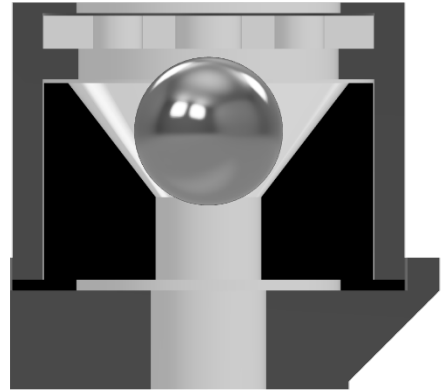
### Valves to Assure Accurate Pumping

Valve action governs the ability of a metering pump to perform with repetitive accuracy within a narrow range of tolerance. Madden pump standard ball valves (see diagram) have large conical rubber seats molded in a variety of compounds. The seat cushions the ball check and grips it to assure a positive seal. The removable seat fits inside the valve body. Since rubber often resists abrasion and corrosion better than rigid materials, valve repairs are minimized.

Several other types of valves are available in the MF series pumps. Spring loaded Type M-200 valves are used with polymers and other liquids with a viscosity up to 2,000 ssu (450cps). Cone type valves and Type M-115 rigid seat valves are also available.

JN series pumps use double ball valves with removable conical Teflon seats for repetitive accuracy at very low flow rates.

MH series pumps use conical shaped, glass filled Teflon, Ceramic or 316 stainless steel seats for high volume valve ball seating.



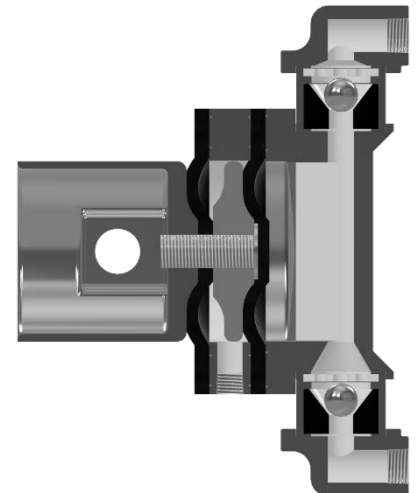
## The Metriflow Diaphragm... Tough As a Tire

Tough, one-piece diaphragms suck the liquid into the pump solution head and push it out again on the compression stroke. The molded rubber and nylon fabric construction diaphragm for the MF and MH series pumps are 1/4" thick. JN series diaphragms are 3/16" thick. The molded-in diaphragm screw connects to the pump piston for positive suction action. Service life is maximized, and fatigue minimized with the short stroke length used in Madden pumps, from 0.090" in the JN series, to 0.380" in the MH series. The contoured design of the diaphragm and the matching piston relieve stress on the diaphragm material. Several types of rubber are available for different liquids. Teflon faced diaphragms are available for highly corrosive material.



## Added Protection with Double Diaphragms

The optional Type DDB double diaphragm provides added protection from the dangerous liquids. When the liquid being pumped is highly corrosive, the backup diaphragm of the Type DDB double diaphragm option will keep the liquid out of the pump body in the event of a leak in the primary diaphragm, allowing the diaphragm to be replaced before the pump is damaged. The Type DDB spacer has a 1/4" NPT connection. The optional MP 138 stainless steel leak detector switch can be used to activate an alarm signal or turn off the power to the pump for automatic leak protection. Alternatively, a clear tube can be installed for visual leak detection.



# Madden Diaphragm Metering Pumps

Serving Industries around the world for over 50 years.

Pump model and specification chart.

Simplex Pumps (one pumping head), Duplex, Triplex, and Quadruplex pumps also available.

Model No.	Output Range Gal/hr	Output Range L/hr	Max Pressure, Plastic SH Psi (bar)	Max Pressure, Metal SH Psi (bar)	Piping Connections NPT	Motor HP (kw)	Strokes per Minute w/ 1725 RPM Motors
JN101_	0.1 - 1	0.38 - 3.8	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	29
JN102_	0.2 - 2	0.76 - 7.6	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	44
JN104_	0.4 - 4	1.5 - 15.1	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	88
JN105_	0.5 - 5	1.9 - 18.9	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	115
JN107_	0.7 - 7	2.6 - 26.5	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	172
JN111_	1.1 - 11	4.2 - 42	150 (10.6)	300 (21.1)	1/4"	1/3 (0.25)	230
MF105_	0.5 - 5	1.9 - 18.9	150 (10.6)	300 (21.1)	3/8"	1/3 (0.25)	29
MF110_	1 - 10	3.8 - 37.8	150 (10.6)	300 (21.1)	3/8"	1/3 (0.25)	29
MF118_	1.8 - 18	6.8 - 68	150 (10.6)	300 (21.1)	3/8"	1/2 (0.37)	58
MF136_	3.6 - 36	13.6 - 136	150 (10.6)	300 (21.1)	3/8"	1/2 (0.37)	115
MF160_	6 - 60	22.7 - 227	150 (10.6)	300 (21.1)	3/8"	3/4 (0.56)	172
MH196_	9.6 - 96	36 - 363	150 (10.6)	150 (10.6)	3/4"	3/4 (0.56)	115
MH1125_	12 - 125	47 - 473	150 (10.6)	150 (10.6)	3/4"	1 (0.75)	172
MH1150_	15 - 150	57 - 568	150 (10.6)	150 (10.6)	3/4"	1-1/2 (1.12)	172
MH1180_	18 - 180	68 - 681	100 (7)	100 (7)	3/4"	1-1/2 (1.12)	172

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

Maximum pressure for pumps with plastic pumping head is 150 psi.

For output capacity using 50 Hz pump motor, multiply data above by 0.833

## Wetted End Materials Available

Pump Series	Solution Head				Diaphragm					Valve Balls						Valve Seats	
	316 SS	PVC	Teflon	Polypropylene	Neoprene	Hypalon	Viton	Teflon Faced	Teflon/Viton	316 SS	Ceramic	Hastelloy C	Alloy 20	Teflon	Viton	316 SS	Teflon
JN Series	•	•	•		•	•	•	•		•	•	•		•		•	•
MF Series	•	•	•	•	•	•	•	•	•	•	•	•		•		•	•
MH Series	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•

# Other Pump Options

## MOTORS AND VARIABLE SPEED DRIVES

- **Standard Motors:** 1725 rpm, TEFC, 56 frame, 1/60/115-230 or 3/60/230-460 power
- **Special Motors Available:** Explosion Proof, Washdown Duty, Mill & Chemical Plant Duty, 50 HZ, etc.
- **DC Variable Speed Drive:** 20:1 turndown ratio, 4-20 mA signal input for automatic pump output control with a signal supplied by a process instrument. Controller box, available in TEFC and Washdown Duty
- **AC Variable Frequency Drive:** Inverter duty, AC motor, controller box, 10:1 turndown ratio, 4-20 mA input control signal capability available with TEFC, Washdown Duty and Explosion Proof motors

## HAVE MADDEN BUILD A FULL SYSTEM

- **Mini Dosing Systems:** Madden has pre-designed, 2.5 sq. ft. dosing skids available. We simply pre-plumb additional valves, meters, fittings, etc., and install as a system on a steel skid. See our Dosing Skid cut sheet for more details.
- **Full Chemical Feed Systems:** Madden also builds pre-engineered and to order chemical feed systems. These systems include tanks and agitators on top of the valves, meters, and fittings a mini dosing system would have. Madden takes pride in customer service and adapting to our clients. Whether you have detailed specifications to follow, or next to nothing, let us know and we'll work with you to build an appropriate chemical feed system for your application.



## ADDITIONAL ACCESSORIES

- **Adjustable Pressure Relief Valves:** A relief valve is a necessity for positive displacement type pumps. Madden keeps several materials and sizes in stock to support our pumps.
- **Adjustable Back Pressure Valves:** Recommended when the outlet/discharge connection pressure is below 20 PSI. Back pressure aids repeatability and accuracy in pump output.
- **Pulsation Dampeners:** For our MH series pumps, pulsation dampeners take some of the “hammer” out of the dosing. This will increase the service life of downstream valves and pipe.
- **Calibration Columns:** Several sizes from 100 mL to 20,000 mL, clear PVC material, used to calibrate pump output at various adjustment knob settings.
- **Leak Detecting Switch, Pressure Type:** Type 316 SS, used with type DDB double diaphragm to signal a leak in the primary diaphragm for prevention of damage from corrosive or dangerous liquids (Part # MP 138). Available with NEMA 4 or NEMA 4x enclosure.

**MADDEN PUMP**

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