

DIVISION OF THE GORMAN-RUPP COMPANY
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STANDARD THREE TANDEM BELLOWS METERING PUMP

DESCRIPTION

The bellows pump size is the actual outside diameter of the bellows. The pump operates on an adjustable stroke, positive displacement principle. Output is adjusted by changing the stroke. The pump is driven by a thermally protected gearmotor which is attached to an adjustable eccentric hub. The bellows, pump body, tubing connectors and valve seats are made of polypropylene (PPR).

Exposure of the motor to extremely dusty or corrosive environment may reduce life.

PRIMING

The pump is self-priming under most conditions: however, the priming ability lessens with greater suction lift, higher discharge head, or with reduced stroke. For dry start up on pumps with anti-siphon spring adjusted at low stroke, pump may not prime. Remove anti-siphon spring, prime pump and replace spring.

After the pump has been primed and is full of liquid, subsequent repriming ability will be improved.

FLOW ADJUSTMENT

Flow rate is modified with the adjustable screw on crank assembly. Loosen lock screw on crank assembly and rotate adjusting screw clockwise to increase flow and counter-

clockwise to decrease flow. Retighten lock screw when desired flow rate is achieved (10 in.-lbs. max.). Do not turn or loosen lock nut on adjusting screw.

Do not reduce output flow by restricting suction or discharge as this will cause excessive pressure within the pump.

PRESSURE

The bellows pump has the ability to discharge into a pressurized system; however, if system or discharge pressure exceeds maximum psi rating of bellows, it may cause damage to the bellows or gearbox.

Maximum PSI Rating:

- ½" modules pump – 50 psi
- ¾" modules pump – 5 psi
- 1" modules pump – 40 psi
- 1½" modules pump – 20 psi
- 2" modules pump – 5 psi
- 2½" modules pump – 5 psi

NOTE: Pumps are designed for use with liquid up to 120°F (49°C) at catalog rated pressure. Reduce the maximum psi rating by 50% for temperatures over 120°F. Not applicable in liquids over 140°F.

VISCOSITY

The pump has been designed to handle a wide range of liquid viscosities. It should be noted,

however, that when pumping thicker liquids it may be necessary to increase the size of connectors and tubing to relieve the pressure buildup within the pump assembly. It is good practice when pumping the heavier liquids to keep the liquid velocity (pump speed) as low as possible.

When pumping heavy suspensions which may tend to settle out, extremely corrosive solutions or any liquid which may tend to become more viscous with time, flush pump after use to increase pump life.

CHEMICAL SERVICE

The bellows pump will handle many different kinds of liquids. For specific chemical service, refer to our Full Line Catalog, Form No. 86216.

Special bellows materials (chlorine resistant and acid resistant) are available. Chlorine resistant bellows are available in ½", ¾", 1", 1½", 2" and 2½" sizes. Pumps using chlorine resistant bellows should have pressure ratings shown in the paragraph under pressure heading reduced by 50%. Acid resistant bellows are available in 1" and 1½" sizes only, and standard pressures apply.

TEMPERATURE

Pumps are designed to operate in 80°F (27°C) ambient temperature. For higher ambient temperature operations, consult the factory.

TROUBLESHOOTING GUIDE

The troubleshooting guide is a suggestion or aid in helping solve problems that might arise.

NOTE: Never work on pump without making certain power is off.

PUMP LEAKS

1. Bellows loose – Turn adjusting screw to full stroke, then rotate crank assembly to maximum bellows compression. Tighten plastic nut on crank assembly to 14 in.-lbs. maximum. **CAUTION:** Overtightening will distort bellows and cause leaks.
2. Connectors loose – Tighten to 5½ to 6½ in.-lbs. torque (finger tight).
3. O-ring defective or missing – See illustration.

MOTOR WILL NOT RUN

1. Cord, plug or switch defective.
2. Wires pulled loose.
3. Motor overtemperature thermostat open, motor overheating or poor ventilation.

UNIT WILL NOT PRIME

1. Pump leaks on suction side (see "Pump Leaks" section).
2. Bellows ruptured.
3. O-ring defective or missing – See illustration.
4. Valves inverted or reversed.
5. Pump air-locked – Temporarily bleed off discharge pressure.
6. Stroke too short – Adjust screw to increase stroke.
7. Viscosity too high.
8. Anti-siphon spring with pump adjusted at low stroke.

PUMP NOISY

1. Fan hitting.
2. Gearmotor worn out.

ERRATIC OR LOW FLOW

1. Valves dirty – Dirt or foreign material in valves.
2. Crank set screw broken.
3. Valves not seating.
4. Connectors loose.

UNIT WILL NOT PUMP

1. Bellows ruptured.
2. Crank broken.
3. Crank set screw broken.
4. Valves dirty – Dirt or foreign material in valves.
5. Valves may have deteriorated.

WARRANTY

Gorman-Rupp Industries warrants to Buyer that products sold by it will upon shipment conform to the description on the face hereof and any written specifications expressly approved by Seller and be free from defects in title, material and workmanship. NO OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXIST IN CONNECTION WITH ANY PRODUCTS SOLD BY SELLER, AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY EXCLUDED.

WARNING

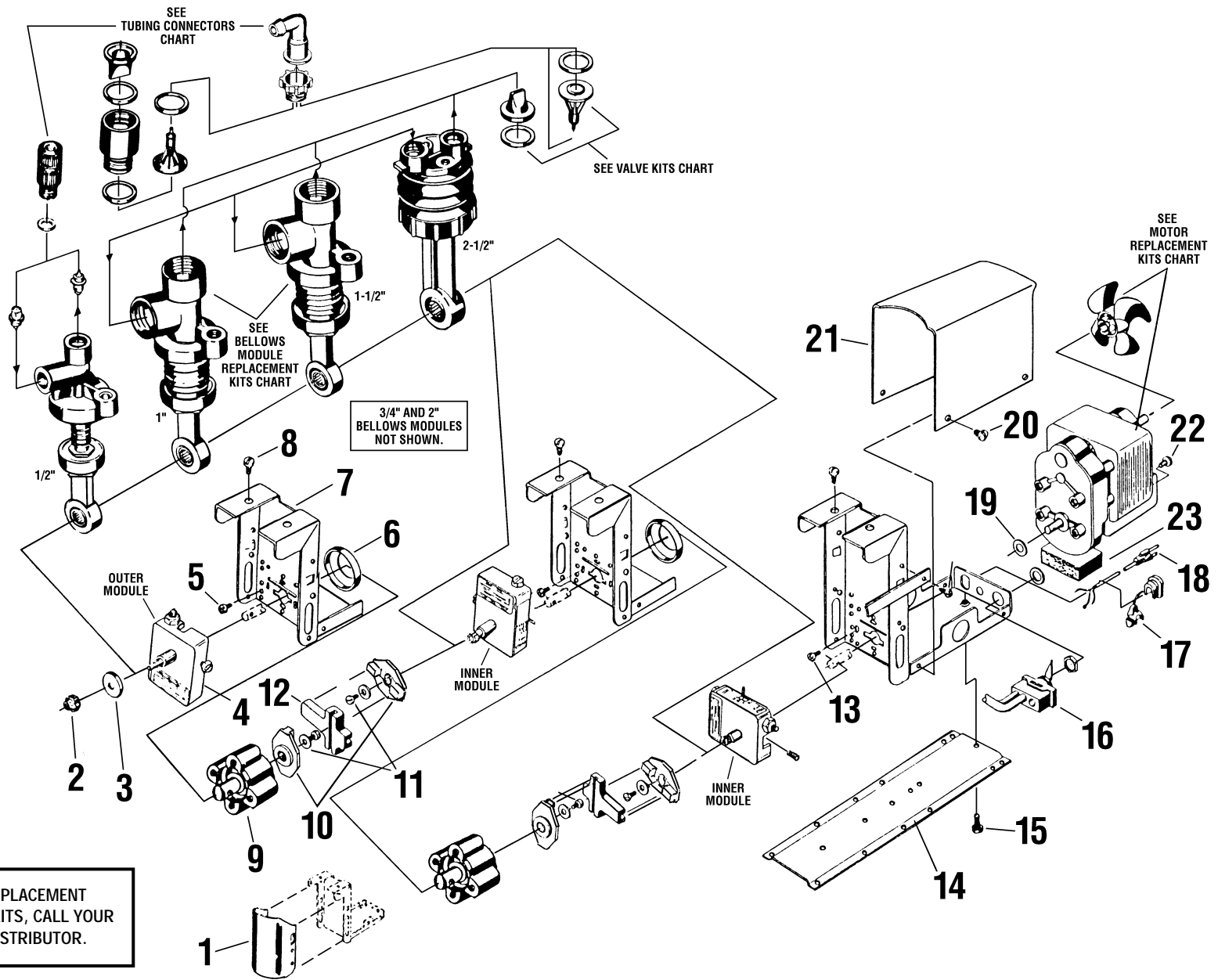
DANGER:

Improper application, installation, adjusting, or servicing can result in serious injury or death. Always disconnect power source before working on these products.

Caution:

Products with electric motors must be properly grounded and may start automatically at any time. For product information, consult Gorman-Rupp Industries, Bellville, Ohio 44813, Phone (419) 886-3001.

EXPLODED VIEW – STANDARD THREE TANDEM BELLOWS METERING PUMP



PARTS LIST

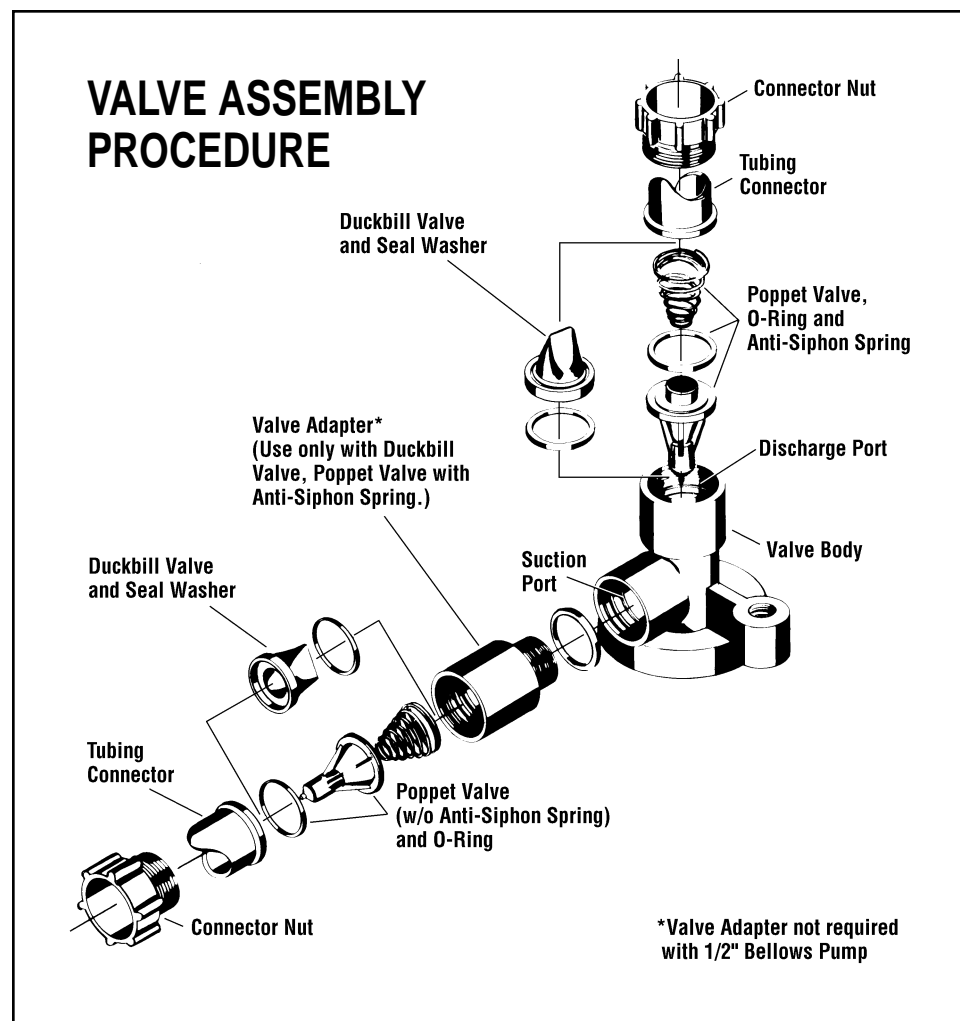
ITEM	REQ.	DESCRIPTION	ORDERING INFORMATION
1	1	Splash Shield	See note below
2	1	10-32 Lock Nut	Included in Crank Assembly Replacement Kit - See Chart
3	1	Flat Washer	Included in Crank Assembly Replacement Kit - See Chart
4	3	Crank Assembly	Included in Crank Assembly Replacement Kit - See Chart
5	8	Bearing Mounting Screw	See note below
6	2	Retaining Guide	See note below
7	3	Mounting Bracket	See note below
8	6	¼-14 Screw	Included in Bellows Module Replacement Kit - See Chart
9	2	Bearing Assembly	See note below
10	4	Drive Coupling	See note below
11	4	Flat Washer & Machine Screw	See note below
12	2	Floating Coupling	See note below
13	4	Motor Mounting Screw	Included in Motor Replacement Kit - See Chart
14	1	Mounting Base	See note below
15	6	Mounting Base Screw	See note below
16	1	Switch	See note below
17	1	Strain Relief	See note below
18	1	Cord & Plug 115V (240V w/o Plug)	See note below
19	1	Washer	See note below
20	4	6-32 Cover Screw	See note below
21	1	Cover	See note below
22	1	8-32 Ground Screw	Included in Motor Replacement Kit - See Chart
23	1	Felt Pad	Included in Motor Replacement Kit - See Chart

NOTE: Parts not available unless stocked by GRI Distributor or purchased in OEM quantities.

MOTOR REPLACEMENT KITS

115 VOLT		240 VOLT	
MOTOR	KIT NUMBER	MOTOR	KIT NUMBER
60 RPM	02500-995	60 RPM	02501-004
90 RPM	02500-999	90 RPM	02501-005

Kit includes Motor, Fan, Felt Pad, Ground Screw and Mounting Screws.



BELLOWS MODULE REPLACEMENT KITS

BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	02500-313	02500-315	02500-314
3/4"	02501-429	02501-426	02501-430
1"	02500-262	02500-274	02500-385
1-1/2"	02500-263	02500-279	02500-379
2"	02501-437	02501-434	02501-438
2-1/2"	02500-237	02500-284	02500-373

NOTE: Kit includes Connecting Rod Assembly, Bellows Module, Displacement Cup, Screws and O-Rings.

TUBING CONNECTORS (2 PER KIT) – POLYPROPYLENE

BELLOWS SIZE	1/8" ID x 1/4" OD COMPRESSION (SMALL)	1/4" ID x 3/8" OD COMPRESSION (LARGE)	3/8" ID ELBOW	1/2" ID ELBOW
1/2"	T-001 (02500-312)			
3/4", 1", 1-1/2"		T-007 (02500-260)	T-008 (02500-261)	T-009 (02500-354)
2", 2-1/2"			T-008 (02500-261)	T-009 (02500-354)

POPPET AND DUCKBILL VALVE KITS

POPPET VALVE KITS			
BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	X-005 (02500-316)	X-002 (02500-318)	X-006 (02500-317)
3/4", 1", 1-1/2"	X-115 (02500-608)	X-112 (02500-605)	X-116 (02500-609)
2"	X-145 (02500-608)	X-142 (02500-605)	X-146 (02500-609)
2-1/2"	X-125 (02500-608)	X-122 (02500-605)	X-126 (02500-609)

DUCKBILL VALVE KITS			
BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	X-095 (02500-600)	X-092 (02500-597)	X-096 (02500-601)
3/4", 1", 1-1/2"	X-035 (02500-325)	X-032 (02500-322)	X-036 (02500-319)
2"	X-155 (02500-325)	X-152 (02500-322)	X-156 (02500-319)
2-1/2"	X-045 (02500-325)	X-042 (02500-322)	X-046 (02500-319)

NOTE: "X" codes are used for identification purposes only, to show elastomer in pump. Use "X" codes on pump label as a guide. Use 8-digit kit number beside corresponding "X" code when ordering replacement valve kit.

Example: If X-005 is on pump label, order kit number 02500-316.

Registered Trademark Names

VITON® DuPont Dow Elastomers
HYPALON® DuPont Dow Elastomers



CRANK ASSEMBLY REPLACEMENT KITS

BELLOWS SIZE	INNER MODULE	OUTER MODULE
1/2"	02500-854	02500-851
3/4"	02501-585	02501-586
1", 1-1/2", 2"	02500-855	02500-852
2-1/2"	02500-856	02500-853

Kit includes 10-32 Lock Nut, Flat Washer and Crank Assembly.

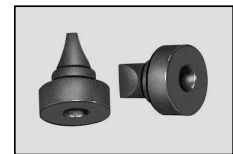
NOTE: "T" codes are used for identification purposes only, to show tubing connectors used in pump. Use "T" code on label as a guide. Use 8-digit kit number beside corresponding "T" code when ordering replacement tubing connector kit.

Example: If T-008 is on pump label, order kit number 02500-261.

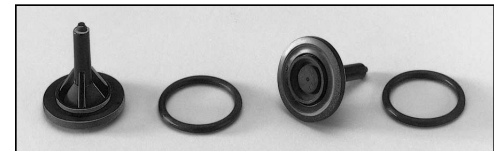
Kit includes (2) Connectors and (2) Connector Nuts.



1/2" Poppet Valve Kit



1/2" Duckbill Valve Kit



3/4", 1", 1-1/2", 2" & 2-1/2" Poppet Valve Kit



3/4", 1", 1-1/2", 2" & 2-1/2" Duckbill Valve Kit



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