

DIVISION OF THE GORMAN-RUPP COMPANY  
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## COMPACT 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 adjustment

screw on the crank assembly. Rotate adjusting screw clockwise to increase flow and counter-clockwise to decrease flow. 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.

**All compact bellows pumps have a maximum rating of 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 1/2", 3/4", 1", 1 1/2" and 2" sizes. Acid resistant bellows are available in 1" and 1 1/2" 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 5 1/2 to 6 1/2 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

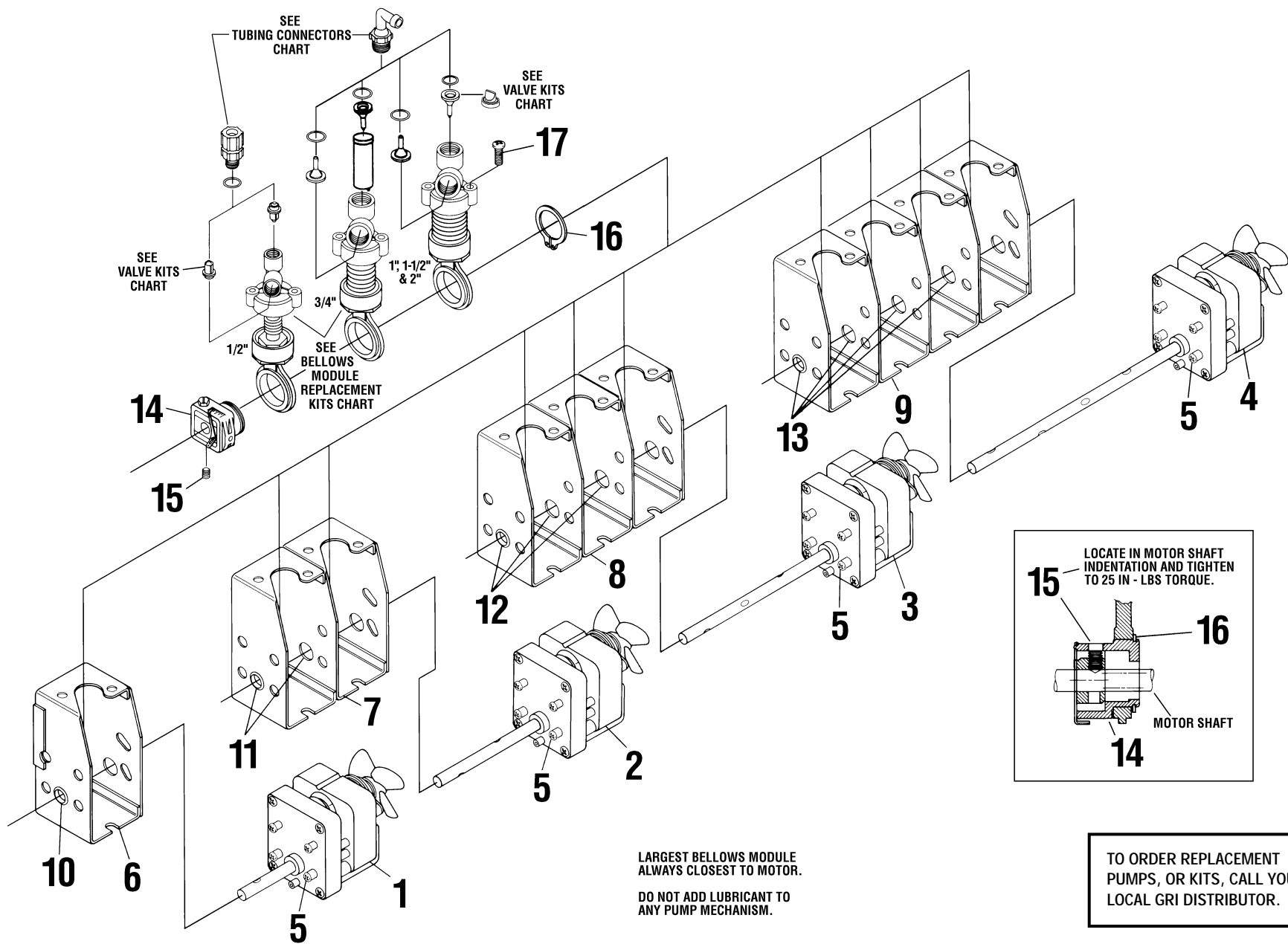
#### DANGER:

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 – COMPACT BELLOWS METERING PUMP



## PARTS LIST

ITEM	REQ.	DESCRIPTION	ORDERING INFORMATION
1	1	Motor Single	See note below
2	1	Motor Dual	See note below
3	1	Motor Triple	See note below
4	1	Motor Quad	See note below
5	4	8-32 x 5/16 Sk Hd Cap Screw	See note below
6	1	Bracket Single	See note below
7	1	Bracket Dual	See note below
8	1	Bracket Triple	See note below
9	1	Bracket Quad	See note below
10	1	Bearing Single	See note below
11	2	Bearing Dual	See note below
12	3	Bearing Triple	See note below
13	4	Bearing Quad	See note below
14	1	Crank Assembly	Included in Crank Assembly Replacement Kit - See Chart
15	1	1/4- 20 Set Screw	Included in Crank Assembly Replacement Kit - See Chart
16	1	Retaining Ring	Included in Crank Assembly Replacement Kit - See Chart
17	2	1/4-14 Screws	Included in Bellows Module Replacement Kit - See Chart

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



3/4", 1", 1-1/2" and 2" Bellows Kit

(Valve extension required only on suction port.)

1/2" Bellows Kit

## BELLOWS MODULE REPLACEMENT KITS

BELLOWS SIZE	HYPALON®	EPT	VITON®/ FLUOROELASTOMER
1/2"	—	02501-185	02501-187
3/4"	02501-251	02501-250	02501-252
1"	02501-189	02501-188	02501-190
1-1/2"	02501-192	02501-191	02501-193
2"	02501-248	02501-247	02501-249

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

## CRANK ASSEMBLY REPLACEMENT KITS

BELLOWS SIZE	KIT NUMBER
1/2"	02501-222
3/4"	02501-327
1", 1-1/2" & 2"	02501-223

Kit includes Retaining Ring, Set Screw and Crank Assembly.



1/2" Poppet Valve Kit



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

## X-CODES

### DUCKBILL VALVES AND O-RINGS

MATERIALS	1/2" BELLOWS	3/4", 1" & 1-1/2" BELLOWS	2" BELLOWS
EPT	X-092	X-032	X-152
Hypalon®	X-095	X-035	X-155
Viton®/Fluoroelastomer	X-096	X-036	X-156

### 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)

**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.

## TUBING CONNECTORS (2 PER KIT) – POLYPROPYLENE

T-CODE	FOR ELASTOMERIC TUBING SIZE	CONNECTOR TYPE	BELLOWS SIZE	KIT NUMBER
T-001	1/8" ID x 1/4" OD	Barbed Compression	1/2"	02500-312
T-002	1/4" ID x 3/8" OD	Barbed Compression	1/2"	02500-635
T-003	3/8" ID	Barbed	3/4", 1", 1-1/2" & 2"	02500-352
T-004	1/2" ID	Barbed	3/4", 1", 1-1/2" & 2"	02500-353
T-005	1/8" pipe thread	Female NPT	3/4", 1", 1-1/2" & 2"	02500-258
T-006	1/8" ID x 1/4" OD	Barbed Compression	3/4", 1", 1-1/2" & 2"	02500-259
T-007	1/4" ID X 3/8" OD	Barbed Compression	3/4", 1", 1-1/2" & 2"	02500-260
T-008	3/8" ID	Elbow Swivel, Barbed	3/4", 1", 1-1/2" & 2"	02500-261
T-009	1/2" ID	Elbow Swivel, Barbed	3/4", 1", 1-1/2" & 2"	02500-354
T-011	1/4" ID	Elbow Swivel, Barbed	3/4", 1", 1-1/2" & 2"	02501-337
T-012*	4mm (5/32") ID	Elbow Swivel, Barbed	3/4", 1", 1-1/2" & 2"	02501-246
T-013*	4mm (5/32") ID	Elbow Swivel, Barbed	1/2" & 3/4"	02501-541
T-014	1/4" ID	Barbed	3/4", 1", 1-1/2" & 2"	02501-673

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.

For flows of 1800 ml/min and above, 1/2" ID tubing connectors recommended.

\*NOTE: Use of 4mm connector is limited by flow rate; please contact factory with specifications.



### Registered Trademark Names

VITON® ..... DuPont Dow Elastomers  
 HYPALON® ..... DuPont Dow Elastomers



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