

# Series "VPA"

## Air Operated Filling and Metering Pumps

### Installation Instructions

#### General Description:

Series VPA Metering Pumps are air-operated, self-priming, positive displacement type pumps designed to meter precise quantities of liquids. The accuracy of the discharge repeatability is approximately 1/2 of 1%. The four sizes of pumps available have a single stroke delivery capacity of 7, 10, 32 or 128 liquid ounces.

#### Installation – Mounting:

Pumps should always be mounted with the end of the liquid discharge line higher than the liquid source to prevent siphoning through the pumps. Pumps can be mounted in any position, but preferably upright. Mounting brackets are furnished and secured to the pumps for mounting on walls, panels or process equipment. See drawing on reverse side for layout of bracket holes.

#### Air Supply:

It is best to have a filtered, lubricated air supply as it will assure maximum service cycle life from the pump. **Caution:** For air line connections and minimum and maximum operating air pressures required for each pump, see chart on reverse side.

#### Liquid Supply:

If the liquid contains particulates, the pump service life can be shortened considerably. It should be filtered before entering the pump. This is especially important in pumps with plastic cylinder walls. If this is not practical, the pump can be mounted with the inlet and outlet at the bottom. This will allow most of the solids to drain out the outlet rather than accumulate on the liquid piston where they may score the plastic cylinder walls.

#### Liquid Connecting Line:

The inlet suction line should be at least the same pipe or tube size as listed in the chart on the reverse side and kept as short as possible. The suction lift should be 10 feet or less with water or similar liquids and even less for heavier liquids.

#### Discharge Line:

It should also be at least the same pipe or tubing sizes that are listed in the chart on the reverse side. Also, if it is longer than 50 feet, increase the pipe or tubing to the next larger size. It can be piped into the atmosphere or into a pressurized line. When pumping to a pressurized line, the amount of pressure in that line would be added to the minimum cylinder operating pressure listed in the charts in order to obtain the actual air supply required. This air pressure must be below or equal to the maximum air pressure rating in the chart.

Maximum vertical discharge line height should not exceed 120 feet for pumps having 100 PSI air line pressure and 40 feet for larger pumps requiring a maximum air line pressure of 40 PSI.

#### Operation:

A four-way air solenoid valve is required to automatically operate the pump. The air solenoid valve must be cycled on and off to achieve the back and forth movement of the pump's piston assembly. A control system (timers, counters, switches, etc.) is needed for this function and is not supplied by Plast-O-Matic. The 4-way air solenoid valves are available as an option from Plast-O-Matic.

If the pump is to operate in a volatile atmosphere, an explosion-proof air solenoid valve is required, however, a general purpose air solenoid valve can be used under this condition providing it is installed outside the area with air lines extending into the area to the pump.

#### Calibration

The stroke adjustment to achieve the metered amount required is a relatively simple operation. The amount to be delivered by the pump must be physically measured in a container to be sure the setting is correct. The maximum rated output (approximate) is obtained when the stroke adjustment bolt is positioned at dimension "D" in the chart. To reduce the amount, simply loosen the lock nut and turn the bolt into the pump end. Use the following ratios to roughly gauge how far to screw in the adjusting bolt. For the 7 and 10 ounce pumps, figure 2.7 ounces per inch. The 32 ounce unit is 7 ounces per inch, and the 128 ounce pump is 28.0 ounces per inch. When the desired measured quantity is obtained, tighten the lock nut. Be careful not to overtighten, otherwise it will damage the thread seal.

#### Fail Dry® Design Concept:

There is a vent on the middle flange opposite the air intake. This will detect any liquid leaking past the piston seals. If excessive, it indicates that the liquid piston seals need replacing or that the cylinder is damaged. It is advisable to pipe the vent to a safe container or safe area when corrosive liquids are being handled.

#### Parts Ordering Information:

When ordering parts, specify the pump model number, the item name, and the material desired. Also, list the chemicals, concentration, pressures and temperatures.

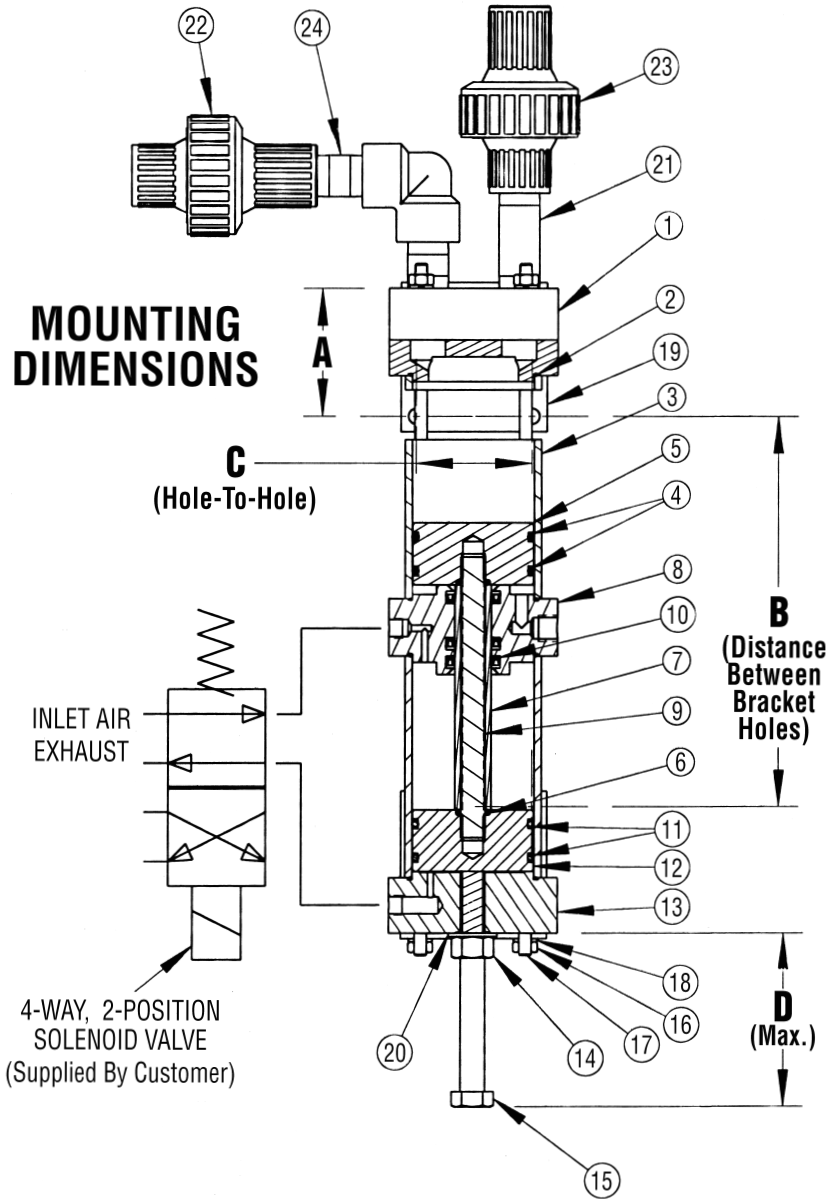
#### Seal Kits

Seal kits are readily available. To order add the prefix SK to the complete model number. Example: SK-VPA32P-V.

#### Seals:

Generally speaking, Viton seals on the liquid side are used for acids and certain solvents. EPDM seals are used for water, salts, and caustics. The air side utilizes Buna-N seals.

# Series "VPA" Air Operated Filling and Metering Pumps Parts List



| Item | Description         | # Req'd |
|------|---------------------|---------|
| 1.   | Liquid Head         | 1       |
| 2.   | O-Ring              | 4       |
| 3.   | Cylinder            | 2       |
| 4.   | Liquid Piston Seal* | 2       |
| 5.   | Liquid Piston       | 1       |
| 6.   | O-Ring              | 2       |
| 7.   | Shaft               | 1       |
| 8.   | Middle Flange       | 1       |
| 9.   | Threaded Rod        | 1       |
| 10.  | U-Cup               | 3       |
| 11.  | Air Piston Seal     | 2       |
| 12.  | Air Piston          | 1       |
| 13.  | Air Head            | 1       |
| 14.  | Lock Nut            | 1       |
| 15.  | Adjusting Bolt      | 1       |
| 16.  | Nut                 | 4       |
| 17.  | Tie Rod             | 4       |
| 18.  | Lock Washer         | 4       |
| 19.  | Bracket             | 2       |
| 20.  | Thread Seal         | 1       |
| 21.  | Outlet Nipple       | 1       |
| 22.  | Inlet Check Valve   | 1       |
| 23.  | Outlet Check Valve  | 1       |
| 24.  | Inlet Nipple        | 1       |

**\*Note:** The standard liquid piston seals are O-Rings. Model numbers ending in the -TC have PTFE Cap Seals mounted over different O-Rings. The liquid piston is different for each type of sealing arrangement.

| MOUNTING DIMENSIONS |         |         |         |         |
|---------------------|---------|---------|---------|---------|
|                     | Model   |         |         |         |
|                     | VPA7    | VPA10   | VPA32   | VPA128  |
| <b>A</b>            | 2 1/2"  | 2 1/2"  | 2 1/2"  | 2 1/4"  |
|                     | 63.5mm  | 63.5mm  | 63.5mm  | 57.1mm  |
| <b>B</b>            | 7 7/8"  | 10.0"   | 11 7/8" | 13 3/4" |
|                     | 200.0mm | 254.0mm | 301.6mm | 349.2mm |
| <b>C</b>            | 2 3/8"  | 2 3/8"  | 2 3/8"  | 9 3/4"  |
|                     | 60.3mm  | 60.3mm  | 60.3mm  | 247.6mm |
| <b>D</b>            | 3 1/4"  | 4 1/4"  | 4"      | 4"      |
|                     | 82.5mm  | 107.9mm | 101.6mm | 101.6mm |

## SERIES "VPA" AIR-OPERATED PUMP SPECIFICATIONS AND PART NUMBERS

| Nominal Stroke Capacity | Inlet & Outlet Pipe Size (NPT) | Nominal Pumping Capacity |                      | Min. Cylinder Operating Pressure |      | Max. Cylinder Operating Pressure |      | Air Cylinder Consumption** (C.F.M.) at Different Air Line Pressures |        |       |         | Cylinder Wall Material | Series VPA Part Numbers |            |           |
|-------------------------|--------------------------------|--------------------------|----------------------|----------------------------------|------|----------------------------------|------|---|--------|-------|---------|------------------------|-------------------------|------------|-----------|
|                         |                                | G.P.M.                   | CM <sup>3</sup> /Sec | PSI                              | Bars | PSI                              | Bars | 40 PSI  | 60 PSI | 80 PS | 100 PSI |                        | EPDM                    | Viton      |           |
| 7                       | 207.0                          | 1/2"                     | .55                  | 34.7                             | 20   | 1.38                             | 100  | 6.90  | .55    | .77   | .99     | 1.21                   | PVC                     | VPA7P-EP   | VPA7P-V   |
| 7                       | 207.0                          | 1/2"                     | .55                  | 34.7                             | 20   | 1.38                             | 100  | 6.90  | .55    | .77   | .99     | 1.21                   | Stainless               | VPA7S-EP   | VPA7S-V   |
| 10                      | 295.7                          | 1/2"                     | .79                  | 49.8                             | 20   | 1.38                             | 100  | 6.90  | .75    | 1.05  | 1.35    | 1.65                   | PVC                     | VPA10P-EP  | VPA10P-V  |
| 10                      | 295.7                          | 1/2"                     | .79                  | 49.8                             | 20   | 1.38                             | 100  | 6.90  | .75    | 1.05  | 1.35    | 1.65                   | Stainless               | VPA10S-EP  | VPA10S-V  |
| 32                      | 946.2                          | 3/4"                     | 2.50                 | 157.8                            | 20   | 1.38                             | 100  | 6.90  | 2.78   | 3.06  | 4.44    | 5.55                   | PVC                     | VPA32P-EP  | VPA32P-V  |
| 32                      | 946.2                          | 3/4"                     | 2.50                 | 157.8                            | 20   | 1.38                             | 100  | 6.90  | 2.78   | 3.06  | 4.44    | 5.55                   | Stainless               | VPA32S-EP  | VPA32S-V  |
| 128                     | 3785.0                         | 1"                       | 10.00                | 631.0                            | 10   | .69                              | 40   | 2.76  | 11.00  | —     | —       | —                      | PVC                     | VPA128P-EP | VPA128P-V |
| 128                     | 3785.0                         | 1"                       | 10.00                | 631.0                            | 10   | .69                              | 40   | 2.76  | 11.00  | —     | —       | —                      | Stainless               | VPA128S-EP | VPA128S-V |

**Note:** To order a metering pump with PTFE cap seals, add a dash (-) and the letters "TC" after the part number.

\*\*Based on ten (10) cycles per minute pumping water.

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SERIES "VPA" METERING PUMPS PARTS LIST & SPECIFICATIONS

INSTALLATION INFORMATION ON REVERSE SIDE