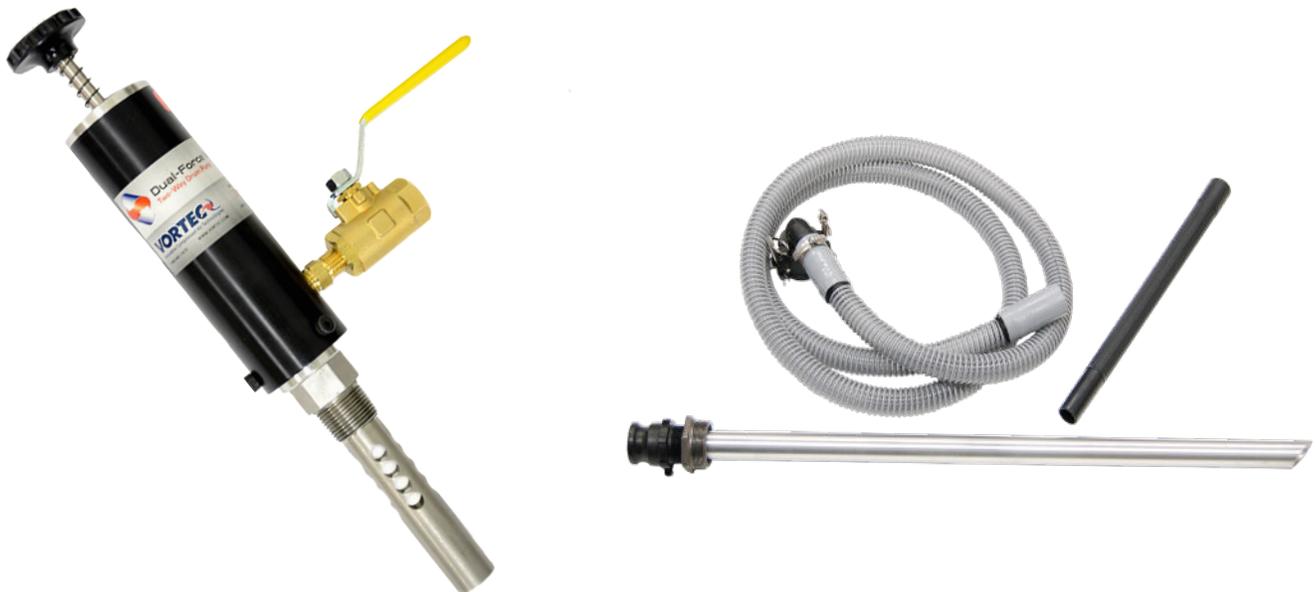


# OPERATION & SAFETY INSTRUCTIONS

## DUAL-FORCE VAC TWO-WAY DRUM PUMP

Model 2109, 2109 BSP Vacuum Pump System



### IMPORTANT

**Please read all instructions BEFORE attempting to use this product**

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# GENERAL SAFETY CONSIDERATIONS

## **WARNING: COMPRESSED AIR COULD CAUSE DEATH, BLINDNESS OR INJURY**

1. Do not operate the Dual-Force Vac Drum Pump at compressed air pressures above 150 psig (10.3 Bar).
2. Do not operate the Dual-Force Vac Drum Pump at line temperatures above 110°F (43°C).
3. Avoid direct contact with compressed air.
4. Do not direct compressed air at any person.
5. When using compressed air, wear safety glasses with side shields.
6. The closed head steel drum must be in "as new" condition and meet the requirements of UN1A1/X1.8/300.
7. Operating the Dual-Force Vac Drum Pump at compressed air pressures above 60 psig requires the use of a drum consisting entirely of 16 gauge steel or stronger.
8. Do not operate the Dual-Force Vac Drum Pump with flammable or volatile liquids such as gasoline, alcohol, kerosene, aviation fuel, mineral spirits or any material that has a low flash point.
9. Do not operate the Dual-Force Vac Drum Pump without the float valve assembly in place secured by the three screws. Operating without the three screws in place could result in a hazardous situation.
10. Do not operate the Dual-Force Vac Drum Pump without the float valve assembly installed between the pump body and the drum.
11. Do not restrict or block the discharge flow of liquid out of the conveying hose.

## **Introduction**

The Dual-Force Vac Drum Pump suctions liquids into and empties liquids from a sealed 55 gallon drum. The compressed air-powered pump is used for handling sludge, used coolant (complete with metal chips), hydraulic oil, tramp oil or solvents. Liquids can be suctioned from milling machines, lathes, EDM machines, sumps, parts washers, open pits or chemical processes, etc.

## **Compressed Air Supply**

The compressed air supply must be filtered to remove water and dirt using a 5 micron or smaller filter. Failure to use a filter may cause clogging of the compressed air paths inside the Vortec product. Filter recommendations are given in Table 1.

Filter elements must be changed on a regular basis. Frequency of change is determined by the condition of the compressed air supply. Filters should be installed in the compressed air supply line as close as possible to the Vortec product.

The appropriate size of compressed air supply line should be selected to ensure optimal performance of the Vortec product. Please refer to Table 2 to determine what supply line size is recommended for your application.

Contact Vortec at 1-800-441-7475 for further assistance.

## **Installation**

Remove the top mounted 2" and 3/4" bung plugs from the closed head steel drum. The customer-supplied drum must meet UN1A1/X1.8/300 specifications and be constructed entirely of 16 gauge steel or stronger.

1. Install the Dual-Force Vac Drum Pump into the 3/4" bung hole in the drum. The lower stainless steel float valve portion of the pump rotates independently of the top part of the pump. This aids in the installation of the pump, and when moving the pump from drum to drum without having to disconnect the air supply hose. Use a 1-1/8" open-end wrench to tighten the lower portion of the pump onto the drum. The top part of the pump is now free to rotate so the ball valve can be positioned in the most convenient location.
2. Attach the compressed air filter (#701S-24A) to the Dual-Force Vac Drum Pump using the pipe fittings supplied. (Air flow arrow must point to the pump.)
3. Connect a compressed air supply hose (3/8" inside diameter minimum) to the compressed air filter (3/8" NPT).
4. Install the 36" (914 mm) long aluminum evacuation tube into the 2" bung hole. Carefully screw the black polypropylene fitting at the end of the tube into the hole in the drum.
5. Attach the cam-lever coupling on the 10' (3 m) long conveying hose to the black polypropylene fitting on the drum. Be sure both levers are engaged in the up position and that the conveying hose is securely attached to the drum.
6. Fit the 19" (483 mm) wand into the cuffed end of the conveying hose.

## Filling the Drum

1. Rotate the knob on top of the pump counterclockwise 1/4 turn until the knob pops up.
2. Open the brass ball valve to operate the unit. Immerse the end of the wand into the liquid to be picked up.
3. If using the Model 2102 Spill Pick-Up Kit, pull the squeegee tool slowly across the surface to pick up liquid spills.
4. The top of the drum will “pop” inward as the vacuum is created and the liquid starts to fill the drum. As the drum reaches maximum capacity, the float valve on the pump will isolate the drum interior from the Dual-Force Vac Drum Pump and the liquid flow will stop. A small amount of liquid may be expelled out the bottom of the Dual-Force Vac Drum Pump before the float valve completely closes. Shut off the brass ball valve to stop the compressed air flow.

## Emptying the Drum

1. Push the knob on the top of the pump down and rotate it 1/4 turn clockwise until it locks in position.
2. Be sure the conveying hose is securely attached to the drum fitting. DO NOT RESTRICT OR IN ANY WAY BLOCK THE FLOW OF LIQUID FROM THE CONVEYING HOSE.
3. Slowly open the brass ball valve.
4. The top of the drum will “pop” outward as the drum is pressurized and liquid starts to flow from the conveying hose. The drum is pressurized to a maximum of 8 psig and is held at this pressure by the pressure relief valve.
5. To stop operation, close the brass ball valve and slowly rotate the knob counter-clockwise on top of the Dual-Force Vac Drum Pump to the “FILL” position. This will aid in venting residual pressure in the drum and stop the flow of fluid.

## Cleaning the Dual-Force Vac Pump Assembly

1. Remove the Dual-Force Vac from the drum and remove the compressed air filter.
2. Turn the knob to the “FILL” position.
3. With a 9/16” open-end wrench, unscrew the brass pipe nipple and ball valve from the side of the pump. Remove the 3 shoulder screws.
4. Lift the cap assembly off the pump body, and pull the float valve assembly from the bottom of the pump.
5. Unscrew the hex barrel from the pump body.
6. Remove the three-lobed centering ring and rubber spacer. Carefully remove the red and/or green shims from the hex barrel.
7. Thoroughly clean the parts in solvent and dry with compressed air.
8. The float valve assembly and the cap assembly should be inspected. Verify that the float moves freely inside the stainless steel guide tube and that the O-ring is attached to the float.
9. The guide rod should move freely in the cap assembly (approximately 25/32” [19 mm] axial travel) and the poppet should move freely on the guide rod (approximately 27/32” [21 mm] axial travel).
10. Inspect the shim(s) removed from the hex barrel. Replace them if they are damaged. (Green= 0.003” thick, Red=0.002” thick)
11. Re-assemble the pump in reverse order of disassembly. Do not over-tighten the hex barrel in the pump body.

## Troubleshooting

Insufficient performance may be caused by the following:

1. Undersized compressed air line size.
2. Compressed air pressure too low.
3. Partial or complete blockage of internal compressed air path, due to dirt.

If trouble persists, please contact Vortec at 1-800-441-7475.

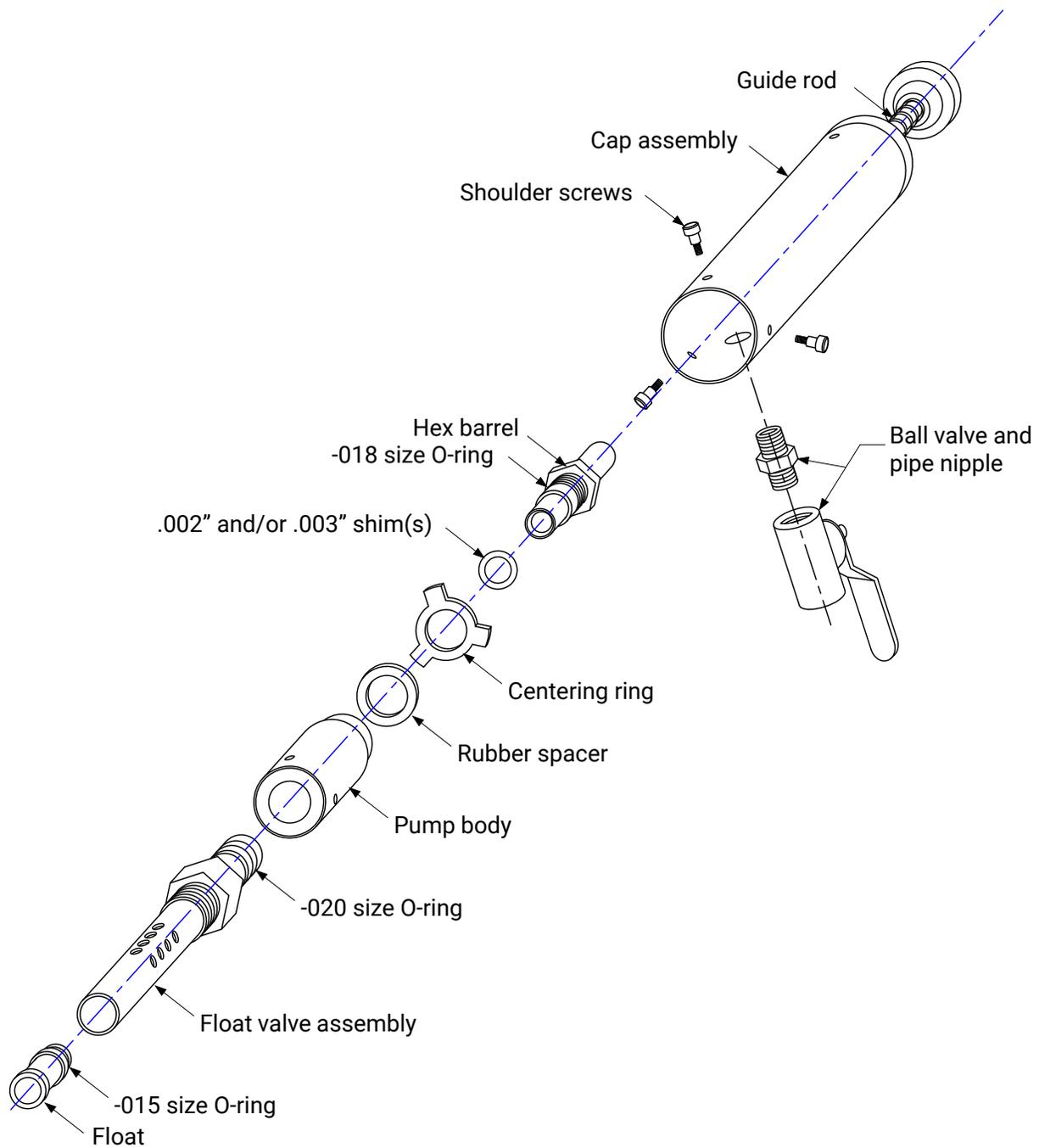
## Limited Warranty

Vortec compressed air products manufactured by ITW Air Management will be replaced or repaired if found to be defective due to manufacture defect within ten years from the date of invoice. Refer to our website [www.vortec.com](http://www.vortec.com) for full warranty details and limitations. ITW Air Management makes no specific warranty merchantability or warrant of fitness to a particular purpose.

# Dual-Force Vac Drum Pump Assembly

(Drawings shown below are not to scale)

## Model 2109



**Table 1: Filter Recommendations**

FILTER AND REPLACEMENT PART ITEM NUMBERS			
Vortec Model	5 micron Air Filter	Oil Removal Filter	Replacement Item
2109	701S-24A	701S-48	10 foot conveying hose, 2100-33

**Table 2: Determining Compressed Air Line Size**

1. Calculate total product compressed air consumption (SCFM, SLPM).
2. Determine length of compressed air line required for connection to main supply.
3. Locate pipe length in left column and read to the right to find the compressed air requirements.
4. Locate pipe size at top of column.

MAXIMUM AIRFLOW (SCFM) THROUGH PIPE AT 5 PSIG PRESSURE DROP (100 PSIG AND 70°F)									
Pipe Length (Feet)	Pipe Size (Nominal) - Schedule 40								
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2
10	29	65	120	254	480	978	1483	2863	4536
20	21	46	85	180	340	692	1049	2024	3208
30	17	37	70	147	277	565	856	1653	2619
40	15	32	60	127	240	489	792	1431	2268
50	13	29	54	114	215	437	663	1280	2029
60	12	26	49	104	196	399	606	1169	1852
70	11	25	46	96	181	370	561	1082	1715
80	10	23	43	90	170	346	524	1012	1604
90	10	22	40	85	160	326	494	954	1512
100	9	21	38	80	152	309	469	905	1435

MAXIMUM AIRFLOW (SLPM) THROUGH PIPE AT 0.3 BAR PRESSURE DROP (6.9 BAR AND 21°C)									
Pipe Length (Meters)	Pipe Size (Nominal) - Schedule 40								
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2
3	821	1840	3396	7188	13584	27677	42117	81023	128369
6	594	1302	2406	5094	9622	19584	29687	57279	90786
9	481	1047	1981	4160	7839	15990	24225	46780	74188
12	425	906	1698	3594	6792	13839	20999	40497	64184
15	368	821	1528	3226	6085	12367	18763	36224	57421
18	340	736	1387	2943	5547	11292	17150	33083	52412
21	311	708	1302	2717	5122	10471	15877	30621	48535
24	283	651	1217	2547	4811	9792	14829	28640	45393
27	269	623	1132	2406	4528	9226	13980	26998	42790
31	255	594	1075	2264	4302	8745	13273	25612	40611

Rubber hose maximum airflow rating: 1/2" I.D. rubber hose = 3/8" pipe; 3/4" I.D. rubber hose = 1/2" pipe