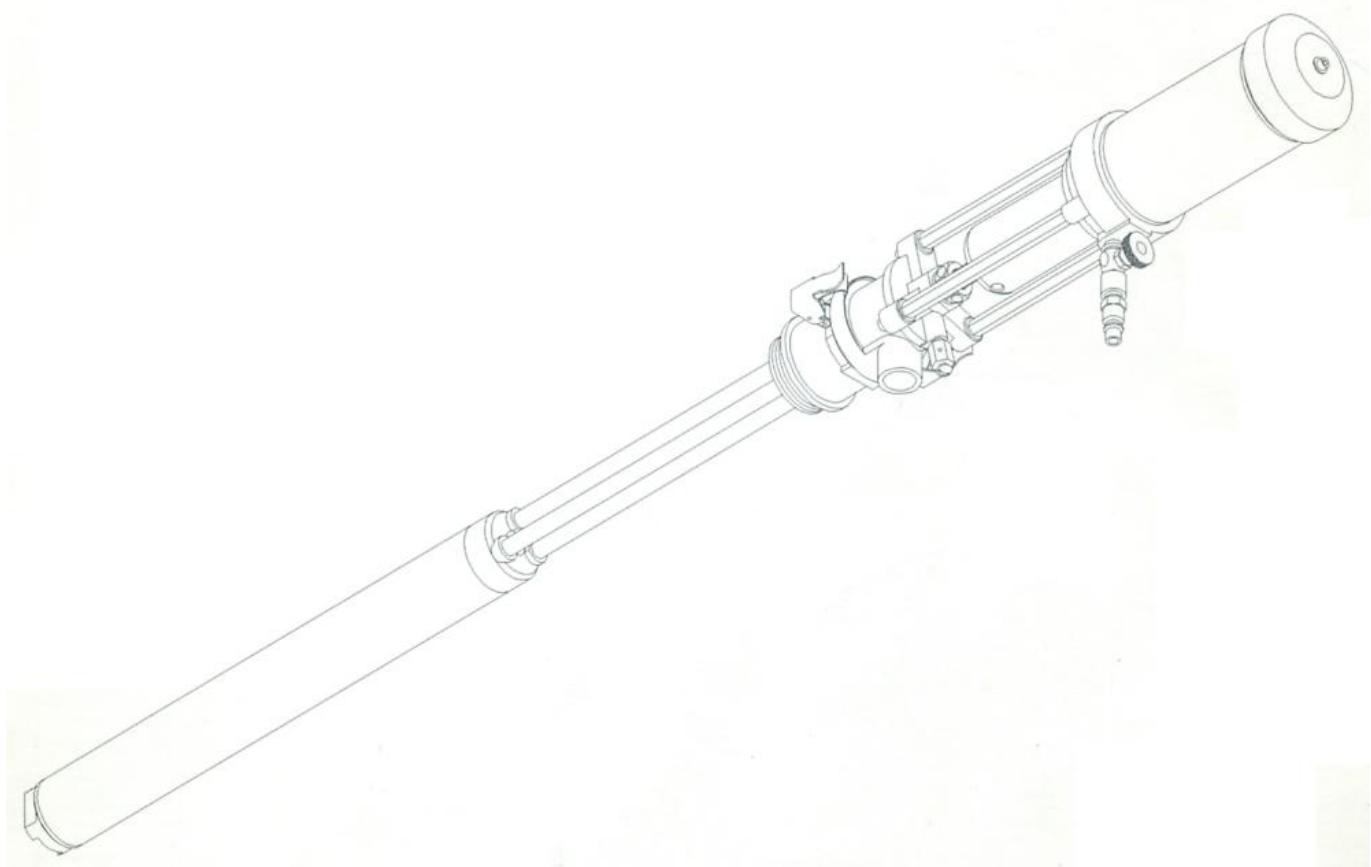




OP232-INST

2:1 RATIO TRANSFER PUMP

*OPERATING MANUAL
WITH PARTS IDENTIFICATION*



IPM INC.

Manufactured by International Pump Manufacturing, Inc.

Covers models: OP232C, OP242CD and OP242A.

Manual Number: MOP232062008

OP232-INST

2:1 RATIO TRANSFER PUMP

OPERATING MANUAL

With PARTS IDENTIFICATION

This manual contains **IMPORTANT WARNINGS** and **INSTRUCTIONS**. Read and retain for reference.

International Pump Mfg, INC.

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FAX: (253) 863 2223

Website : www.ipmpumps.com

For Technical Service Call Your Local Distributor

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Printed: June 2008

WARNING: The equipment described herein must only be operated or serviced by properly trained individuals, thoroughly familiar with the operating instructions and limitations of the equipment.

Notice: All statements, information and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty or responsibility of any kind expressed or implied. Statements or suggestions concerning possible use of IPM equipment are made without representation or warranty that any such use is free of patent infringement, and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required.

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OP242CD lower section pump inlet.....	6.2
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1.0 SPECIFICATIONS

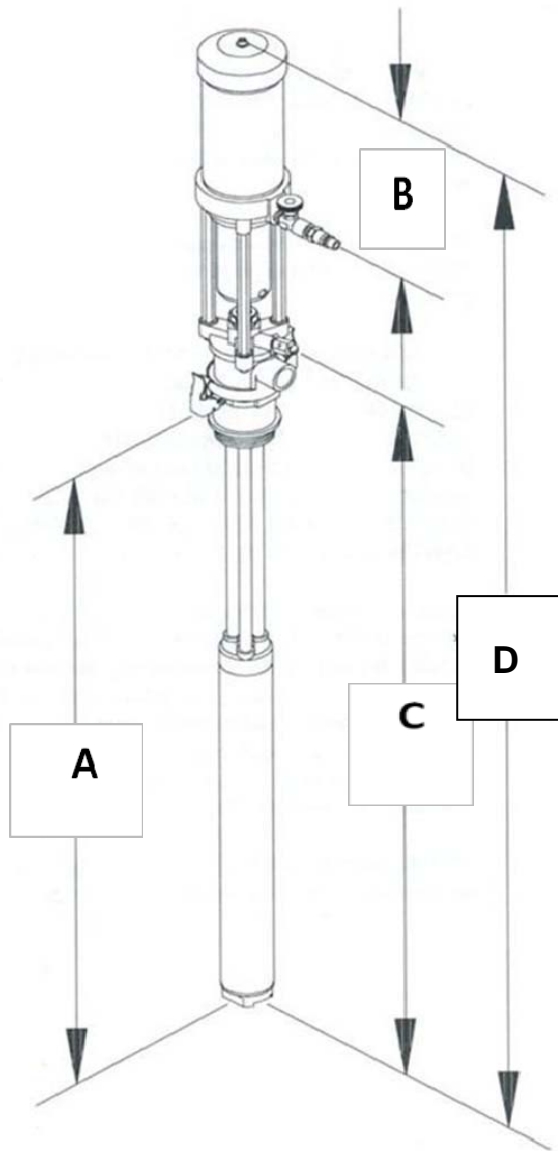
Pressure Ratio: 2.25:1
Output (Continuous duty): 5.5 G.P.M.
Output (Intermittent duty): 11 G.P.M.
Cycles per gallon: 18.5
Stroke: 4 in.
Air Pressure: 180 P.S.I.
Air Inlet: ¼" NPT (F)
Fluid Output: ¾" NPT (F)
Air consumption: 2.0 C.F.M. per gallon- pumped @ 100 P.S.I.
Weight: 30 lbs.
Wetted parts: Stainless Steel, Viton, Teflon

Measurements in inches

Pump	A	B	C	D
OP232C	33	8.34	36.75	54
OP232C w/ tote extension	38.5	8.34	42.25	59.5
OP242CD	32.5	8.34	36.25	53.5
OP242A	25	8.34	28.75	46

Measurements in centimeters

Pump	A	B	C	D
OP232C	83.82	21.18	99.35	137.1
OP232C w/ tote extension	97.8	21.18	107.3	151.1
OP242CD	82.6	21.18	92	135.9
OP242A	63.5	21.18	73	116.8



1.5

Reactor System Components

How to select system components for your Reactor

1 Select a Reactor

Choose from 10 models with air, electric or hydraulic motors.

KEY FEATURES:

- Quick knock down fluid sections
- Optional data reporting capabilities
- Foam models rated at 2000 psi (1.38 bar, 13.8 MPa)
- Polyurea models rated up to 3500 psi (240 bar, 24.0 MPa)

2 Select Heated Hoses

Choose from pressure ratings of 2000 psi or 3500 psi (1.38 to 240 bar, 13.8 to 24.0 MPa).
Choose 3/8 in or 1/2 in IDS.

3 Select Heated Whip Hose

Choose from pressure ratings of 2000 psi or 3500 psi (1.38 to 240 bar, 13.8 to 24.0 MPa).
Choose 1.4 in or 3/8 in IDS.

4 Select a Fusion Gun

Choose from air- or mechanical-purge with a round or flat pattern.

AIR-PURGE GUN

- Easiest-to-use gun on the market
- Clean up in 10 seconds
- Longer life components

MECHANICAL-PURGE GUN

- Best mix on the market
- Smoother finish for low output applications
- Long-lasting mix module

Select Supply Processing Equipment

5 SUPPLY PUMP

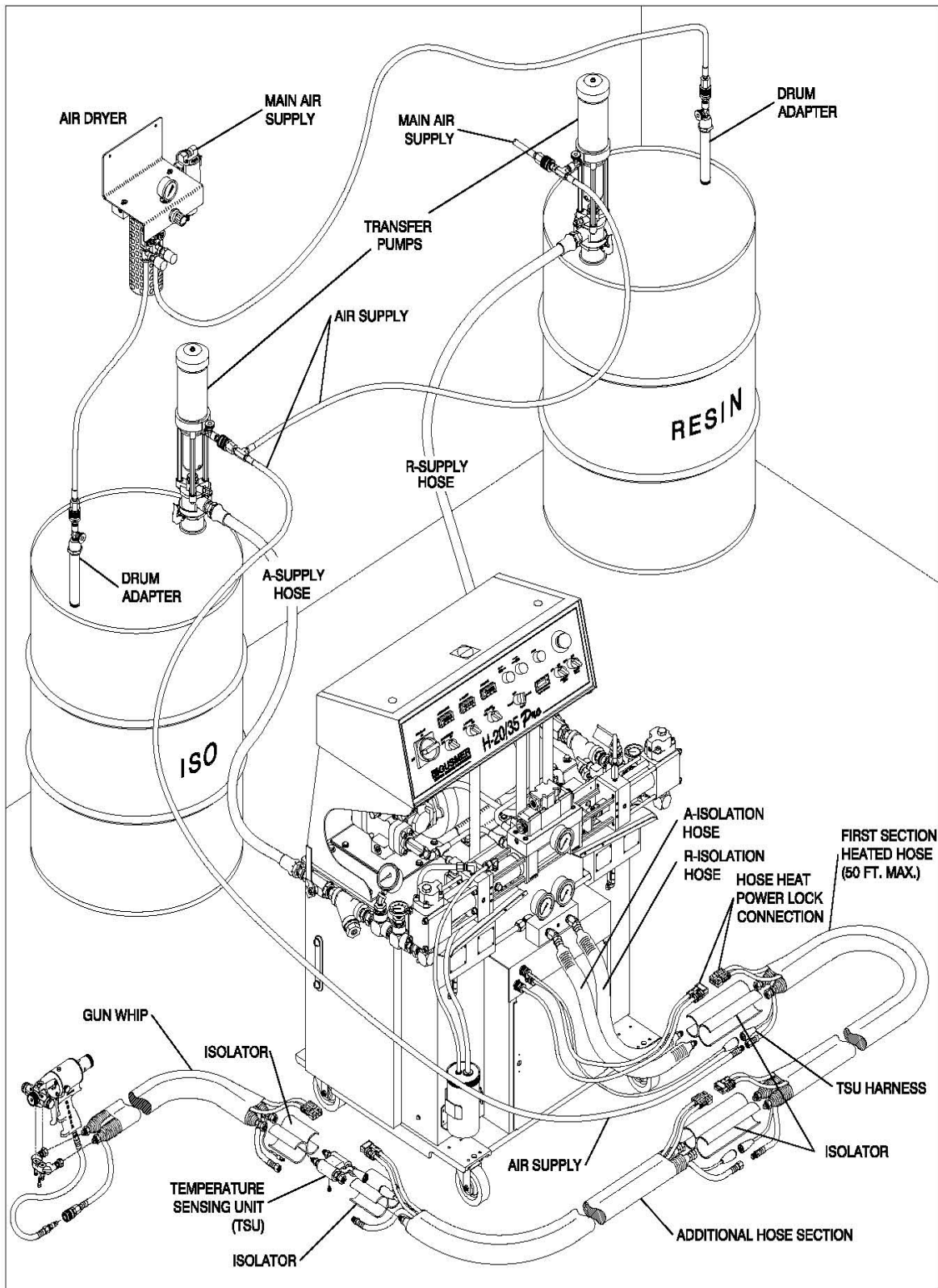
Choose from diaphragm or piston pumps for standard materials in drum-mount or wall-mount. Select a 2:1 piston pump for materials with higher viscosities.

6 AGITATOR KITS

Choose a kit to agitate your resin for a consistent coating. Graco's patented Twistorik® agitators are very low shear to minimize material frothing.

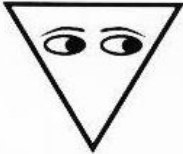


2.0 H-20/35 PRO SERIES PROPORTIONING UNIT SET-UP

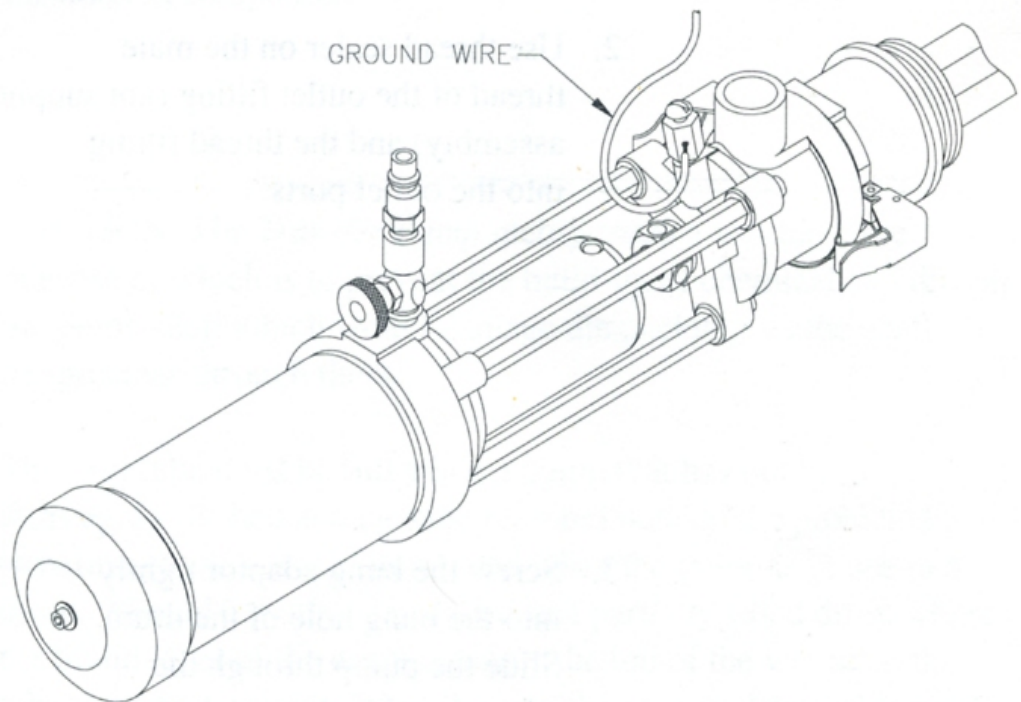


3.0 INSTALLATION

The dimensional drawing in the specification section (7.0) gives the measurement needed for custom installations.



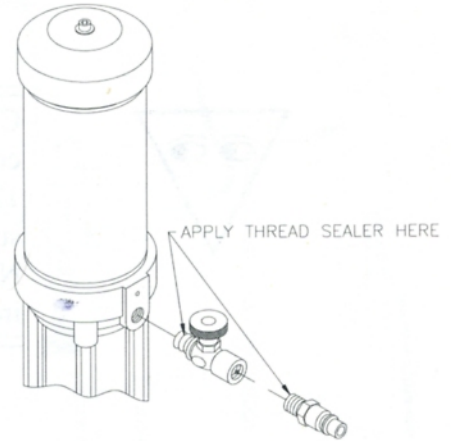
CAUTION: Whenever you are planning flammable materials, connect a ground wire to the pump air motor. Use a minimum of 12 gage wire and securely connect the other end to a good ground such as a steel building column or water pipe. Consult the National Electric Code, State, and local codes for additional information.



A 3/8" ID or larger air line is recommended to deliver air to the *Transfer Pump*.

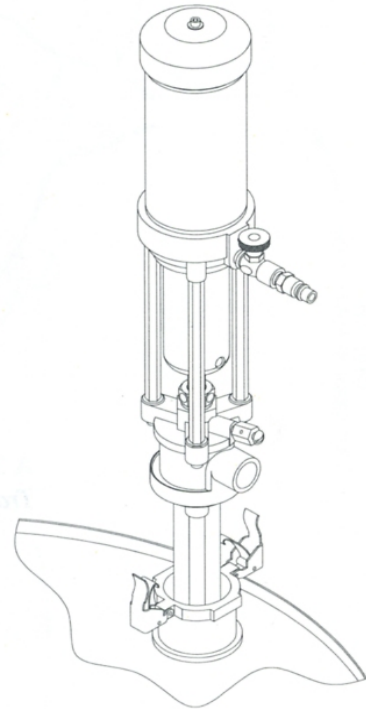
When using *2:1 Transfer Pump* with the Model FF Proportioning units, it is recommended that a pressure regulator be used to limit the hydraulic pressure to 100psi. Pressures exceeding 100 psi will tend to cause spray pattern deformation on the upstroke of the proportioning pump.

1. Use thread sealer on the male threads of the air needle valve and quick disconnect plug. Install in the air inlet as shown.

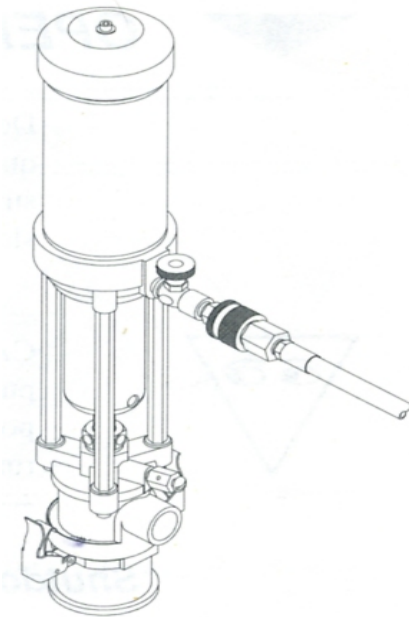


2. Use thread sealer on the male thread of the outlet fitting (not supplied as part of the pump assembly) and the thread fitting into the outlet ports.

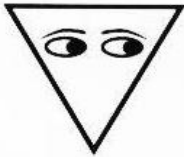
3. Screw the bung adaptor tightly into the bung hole of the drum. Slide the pump through the adaptor and lock it in place.



4. Install air line as required.



Installation completed!



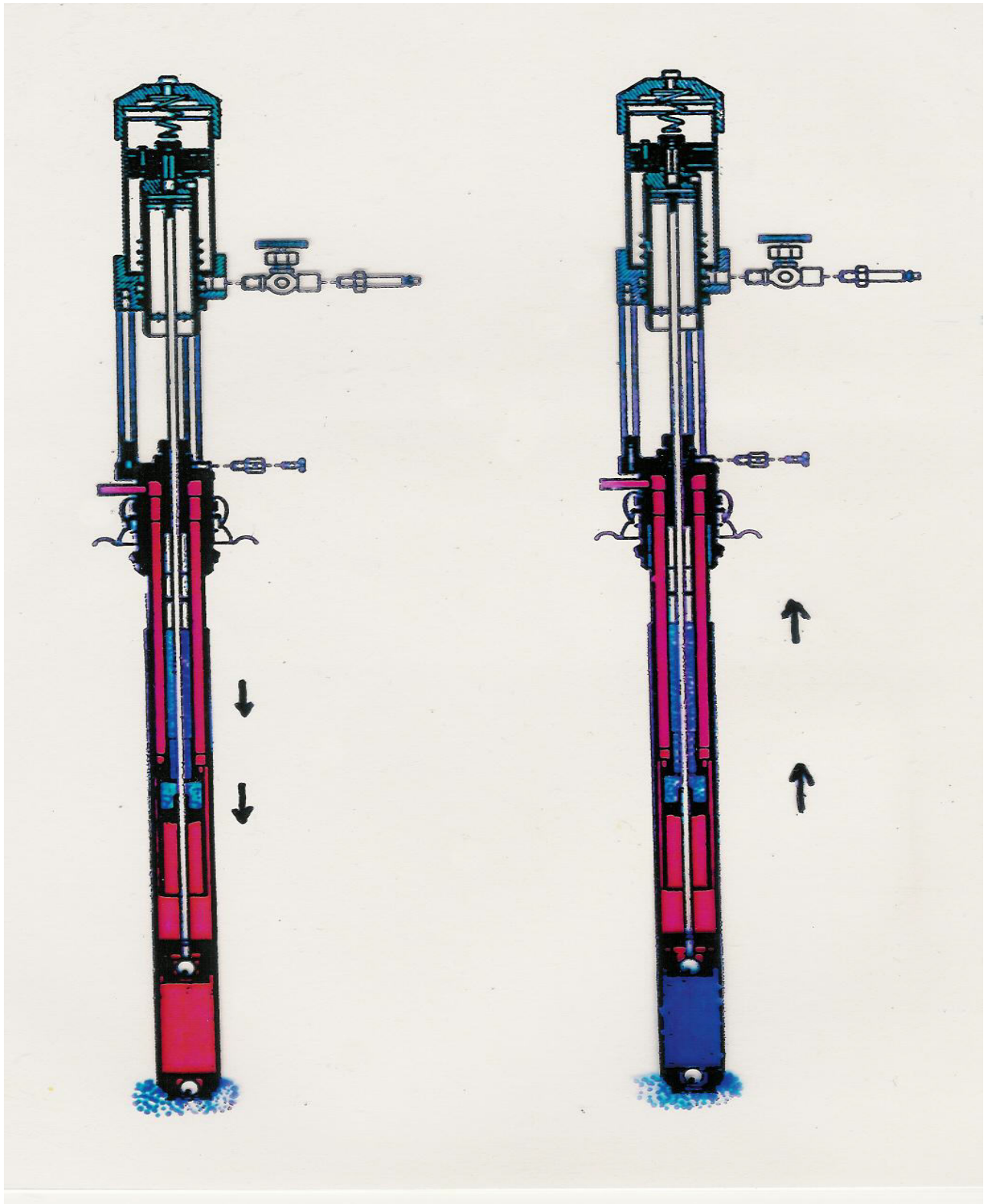
CAUTION: The *Transfer Pump* incorporates a wet tube, the purpose of which is to prevent the build-up of chemical and dirt on the pump shaft which would damage the packing as the shaft reciprocates through them.

This wet tube must be full when a pump that has not been thoroughly flushed and cleaned is stored outside the protected environment of a sealed drum, and when the pump is in use in a drum. Should a pump be installed in a partially filled drum where the liquid level of the drum is below the top of the wet tube, the tube must be manually filled (be sure the proper chemical is used) prior to inserting the pump in the drum. Also, should a drum with a pump installed be tipped over, insure that the wet tube is full once the drum is righted.

As there is no difference in the pump used for pumping resin or Isocyanate, once a pump is committed to a particular chemical, it would be good practice to identify the Isocyanate pump with red and the resin pump with blue to help reduce the possibility of mix up.

4.0 OPERATIONAL INFORMATION

4.1 Physical Operation Illustration



Operation of OP232C and OP242A pumps

The first pump on the left is showing a down stroke. Explanation:

- ◆ In the down stroke, the foot valve seats and the inner check valve opens as the piston goes down.
- ◆ At the same time the inner cylinder piston is coming down, pumping in the down stroke displacing this material out the bottom of this cylinder back into the larger tube area and up through the three tubes and out. The bottom area is full of product so the inner check ball is open as it goes down pushing the product from the top of the foot valve area (now closed) up into the center area.

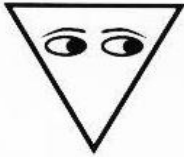
The pump on the right, is showing an up stroke. Explanation:

- ◆ As the pump goes in the up stroke; the bottom foot valve opens to fill the lower cavity.
- ◆ The inner check valve closes and takes twice the amount of product in the upward motion.
- ◆ As this product goes up, 1/2 of the material goes into the upper/inner cylinder while the other half goes up through the three tubes and out.
- ◆ This leaves some material in the upper cylinder for the next down stroke; which when it pumps, also displaces product out through the tubes.
- ◆ Then the pump cycle repeats itself.

Note: This is considered to be a double acting pump in that the pump does pump product in both directions; the up as well as the down stroke.

4.2 Shut down and dis-assembly:

Determine that the air needle valve is closed. Connect the airline quick disconnect coupler to the pump and turn on the main air supply. Slowly open the air needle valve until the pump is running slowly. Use the air needle valve to control the pump speed.



CAUTION: Never allow the pump to run dry of material being pumped. A dry pump will quickly accelerate to a high speed and possibly damage the pump. If the pump accelerates quickly or is running too fast, stop it immediately and check.

Shutdown

For shutdown, disconnect the air line coupler. After all the air pressure has bled off, close the air line needle valve.

If the pump is to remain idle for a short period of time do not empty the wet cup. The material in the wet cup protects the pumping section from contamination.

For extended periods of shutdown, it is recommended that the pump be completely flushed, disassembled and thoroughly cleaned and stored in a dry place.

Disassembly

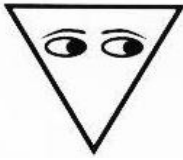


WARNING: To avoid personal injury, always disconnect the air coupler and relieve all air and hydraulic pressures before servicing the pump.

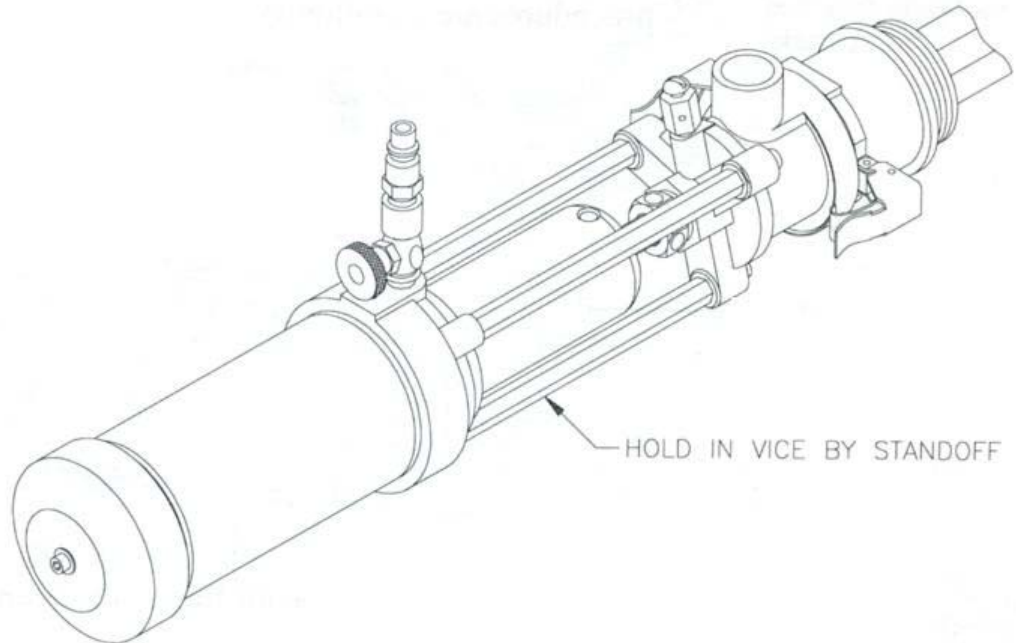
NOTES:

1. All threads are right hand.
2. If you are using a repair kit to service the pump, use all the parts provided in the kit regardless of the apparent condition of the old ones. This will reduce the possibility of having to rebuild the pump sooner than expected.

1. Place the pump in a vice.



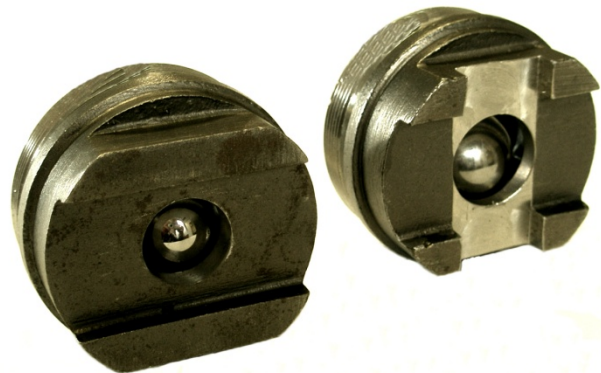
CAUTION: Do not clamp the pump tightly.



2. Remove the foot valve housing using a 1 5/8" open-end wrench.

NOTE:

It might be necessary to place a strap wrench around the lower end of the suction tube when removing the foot valve



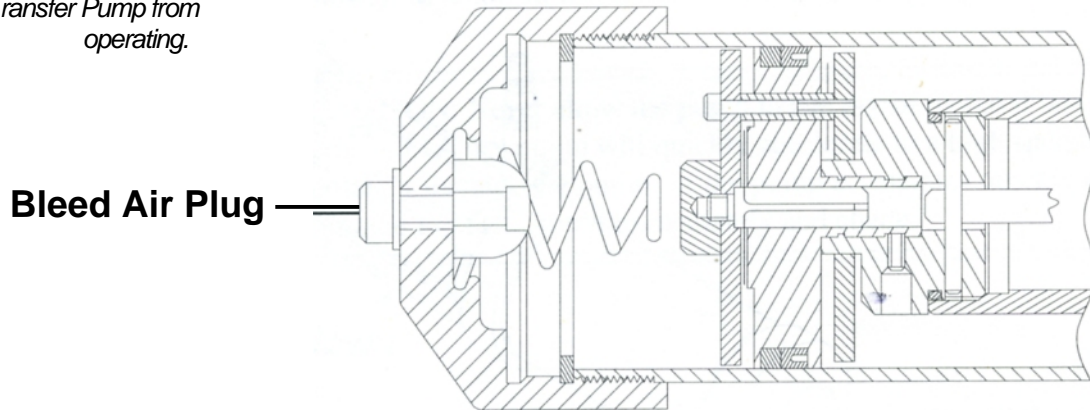
The left foot valve is the old style, and the right one is the new High Flow. The part number will be the same for both- even though the old style valve will be discontinued. The part number is 500071.

IMPORTANT

NOTE:

Be sure to replace the bleed air plug when reassembling the cylinder. Failure to do so will prevent the Transfer Pump from operating.

The transfer pump air cap incorporates an air bleed which must be removed prior to disassembly of the air cylinder to bleed off any air pressure trapped in the cylinder. The proper disassembly procedures are as follows:



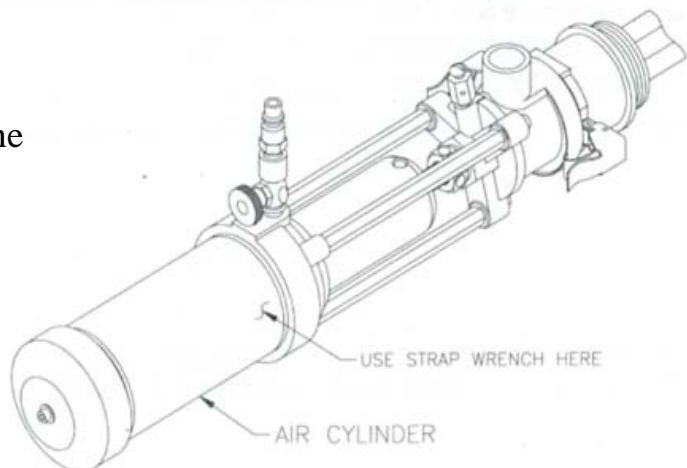
- A. Disconnect the air line to the Transfer Pump.
- B. Open the air needle valve.
- C. Remove the bleed air plug.

The air motor is now ready for disassembly.

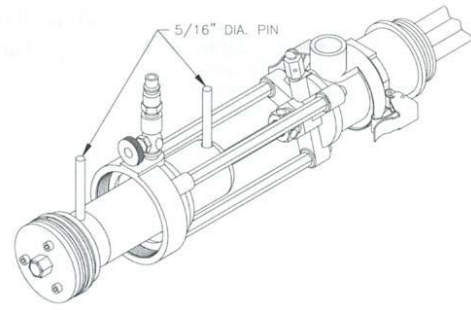


WARNING: The air cylinder contains pressurized air which must be completely exhausted prior to disassembly. Failure to do so may cause serious injury to personnel and/or property damage.

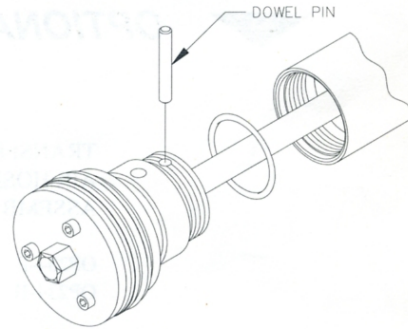
3. Place a strap wrench around the lower end of the air cylinder and unthread.



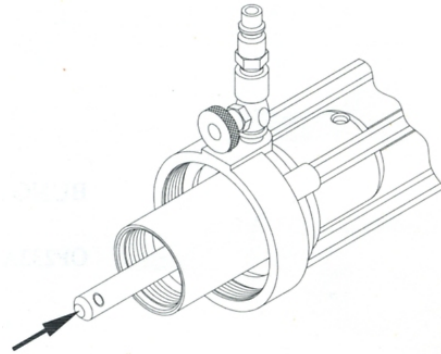
4. Use a 5/16 in. dia. Pin to keep the piston rod plunger from rotating. Unthread the piston.




5. Remove the dowel pin.

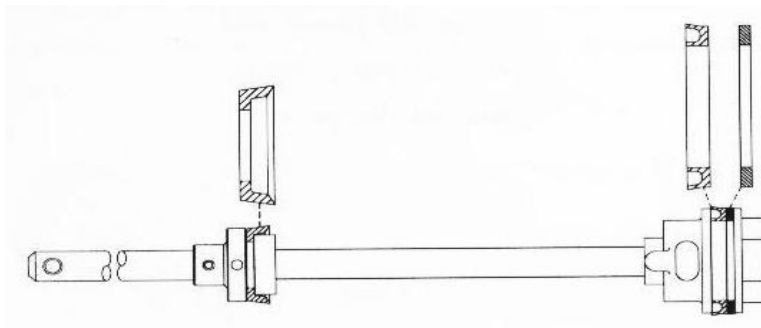


6. Push the piston out through the suction tube.



7. Inspect and replace the packing as required.

Note:  When replacing the packing pay careful attention to the packing orientation.

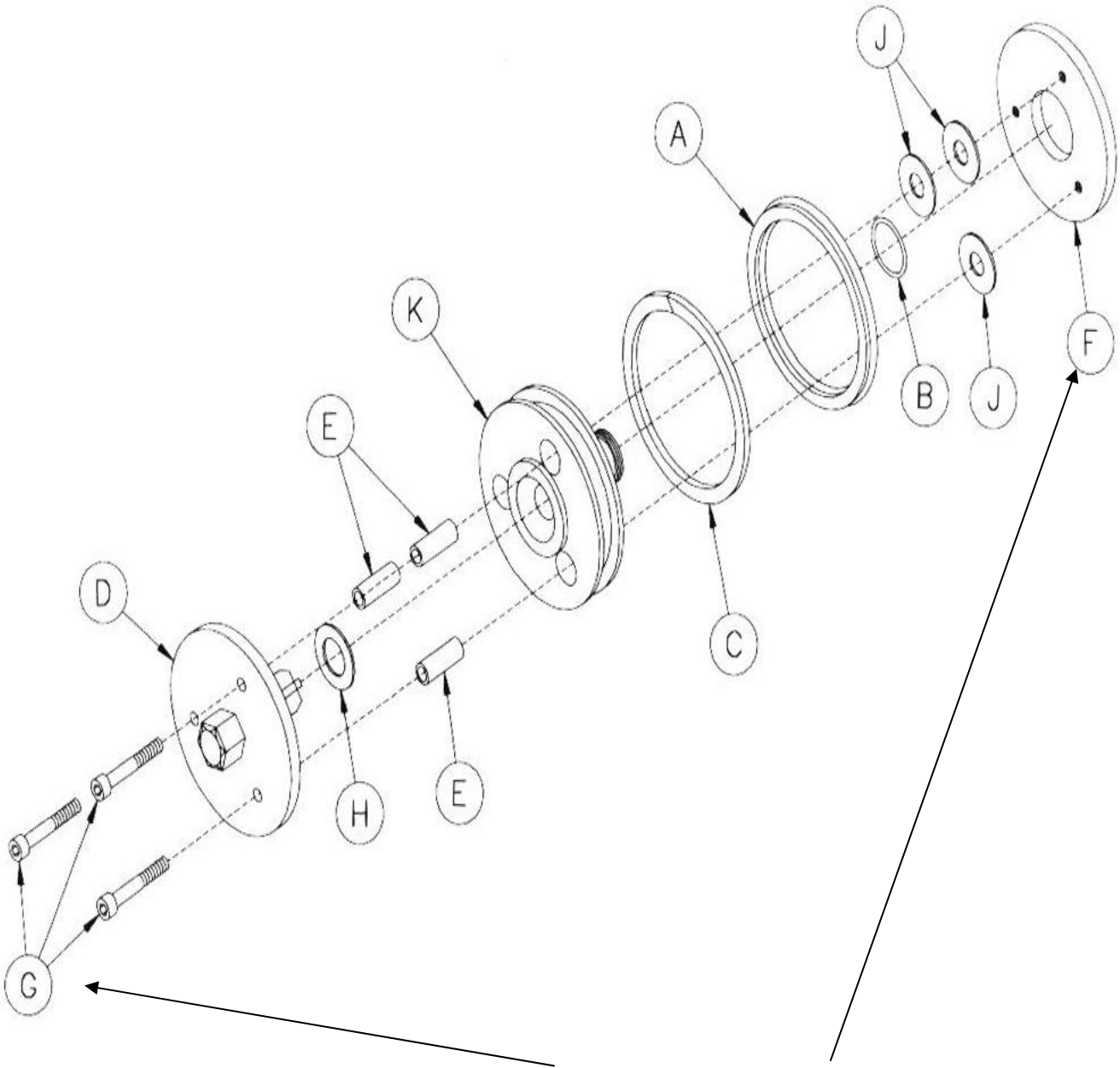


8. Lubricate, install, and assemble the parts in reverse order.

NOTE

This page for notes and to balance page format.

5.0 AIR MOTOR ASSEMBLY DRAWING (OP237A)



NOTE: When replacing Lower Air Valve (F) and the Socket Head Cap Screws (G), it is imperative that a Liquid Thread Sealing Compound be used to prevent the assembly from becoming loose.

Air Motor Assembly Parts List (OP237A)

	PART LETTER	NEW PART NUMBER	OLD PART NUMBER	DESCRIPTION	QTY
*	A	500018	OP232-1-16	U-Cup	1
*	B	500019	OP232-1-21	O-Ring	1
*	C	500017	OP232-1-6	Wear Ring	1
	D		OP237-1	Upper Air Valve Assembly	1
	E	500012	OP237-3	Spacer	3
	F	500013	OP237-4	Lower Air Valve	1
	G	500014	OP237-5	Socket Head Cap Screw	3
*	H	500015	OP237-6	Gasket Top	1
*	J	500016	OP237-7	Gasket Bottom	3
	K	500011	OP237A-2	Air Piston	1

* Also included in the **2:1 Rebuild Kit** (part #OP232-50). Order as required from your local distributor

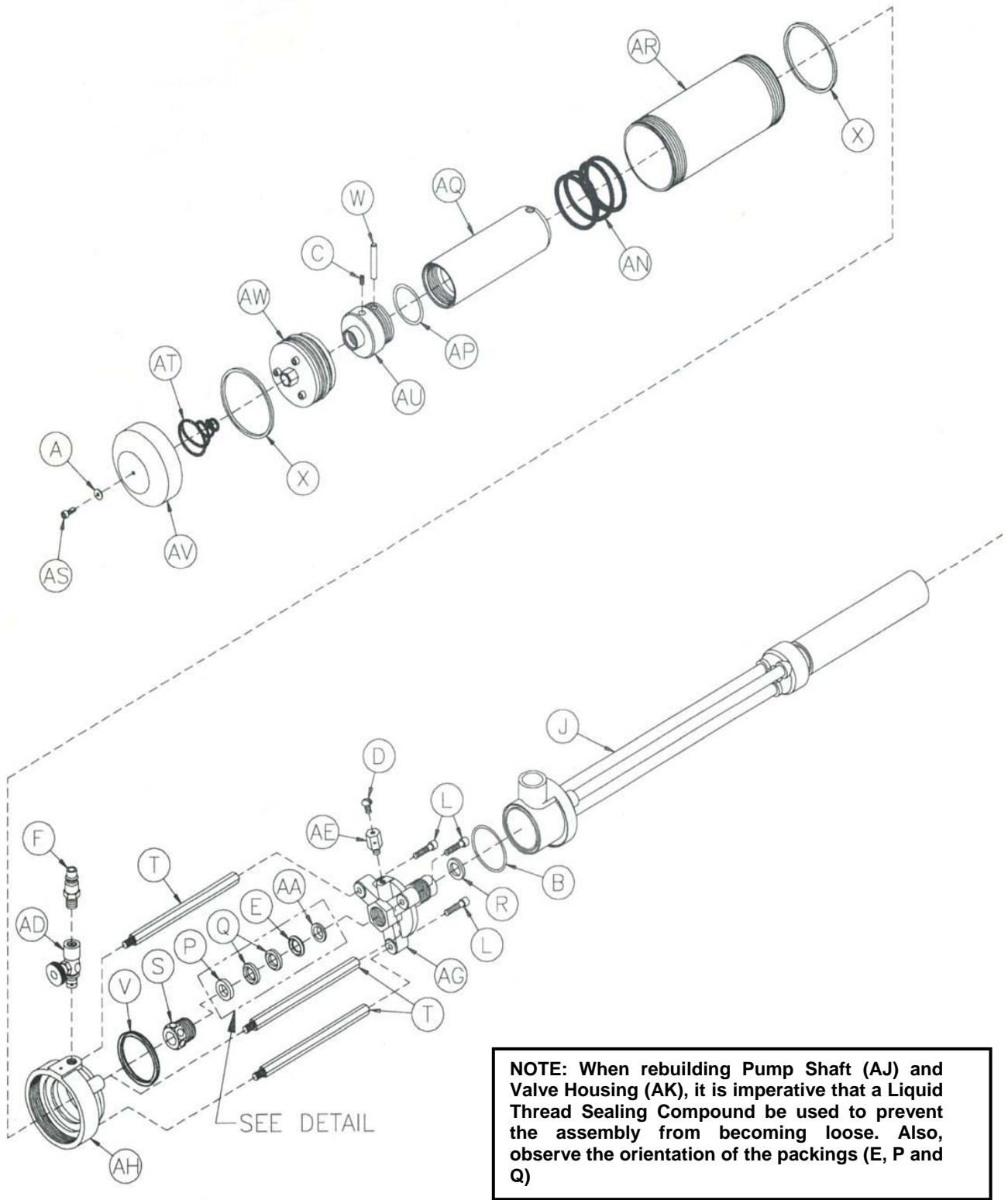
5.1 Air Motor Physical Photo:



Do not use a wrench on the upper hex!

6.0 PARTS DIAGRAM AIR & FLUID SECTIONS

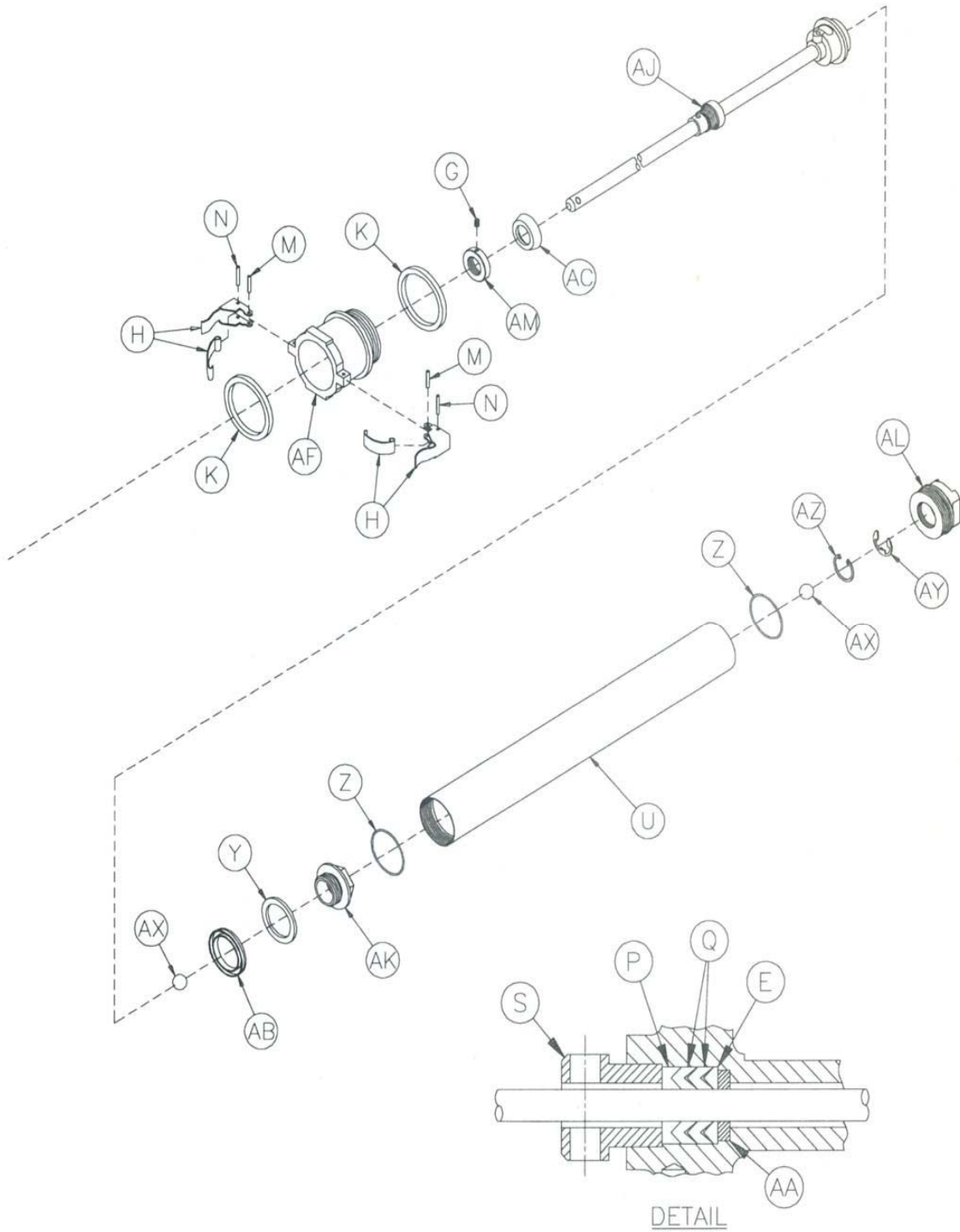
(OP232C, OP242A & OP242CD)



6.1 Parts List Fluid Section (OP232C & OP242A)

	NEW		OLD PART	DESCRIPTION	QTY
	PART LETTER	PART NUMBER	NUMBER		
	A	500002	579-6	Fiber Washer	1
*	B	500042	1484-5	O-Ring	1
	C	500021	1512-5-2	Socket Set Screw	1
	D	500039	4605-10	Round Head Machine Screw	1
*	E	500035	5812	Seal Expander	1
	F	500029	6745-2	Male Plug	1
	G	500062	12119	Soft Point Set Screw	1
	H	700009	OP233A-2	Bung Adapter Clamp (Includes M & N)	2
**	J	700012	OP231A-1-11	Pump Body (OP232C)	1
		700007	OP241A-1-11	Pump Body (OP242A & OP242CD)	1
*	K	500053	OP200-2-2-2	Gasket (See note on Nylon Gasket)	2
	L	500040	OP231-1-1	Socket Head Cap Screw	3
	M	500051	OP231-1-12-4	Roll Pin	2
	N	500052	OP231-1-12-5	Roll Pin	2
*	P	500033	OP231-1-13	Seal Retainer	1
*	Q	500034	OP231-1-14	FE Packing	2
*	R	500041	OP231-1-15	Gasket	1
	S	500031	OP231A-1-17	Packing Nut	1
	T	500032	OP231-1-18	Standoff	3
	U	500067	OP231-1-2	Suction Tube	1
	V	500030	OP231-1-20	U-Cup	1
	W	500022	OP231-1-22	Dowel Pin	1
*	X	500006	OP231-1-23	O-Ring	2
*	Y	500064	OP231-1-26	Wear-Ring	1
*	Z	500066	OP231-1-28	O-Ring	2
*	AA	500036	OP231-1-33	Wiper	1
*	AB	500063	OP231-1-4	U-Cup	1
*	AC	500061	OP231-1-8	Cup Packing	1
	AD	500028	OP231-2	Needle Valve	1
	AE	500038	OP231-3	Grounding Lug	1
	AF	500048	OP231A-1-12-1	Bung Adapter	1
	AG	500037	OP231A-1-16	Air Cylinder Mounting Flange	1
	AH	500027	OP231A-1-19	Air Cylinder Base	1

Parts List Fluid Section Continued (OP232C & OP242A)



Parts List Fluid Section Continued (OP232C & OP242A)

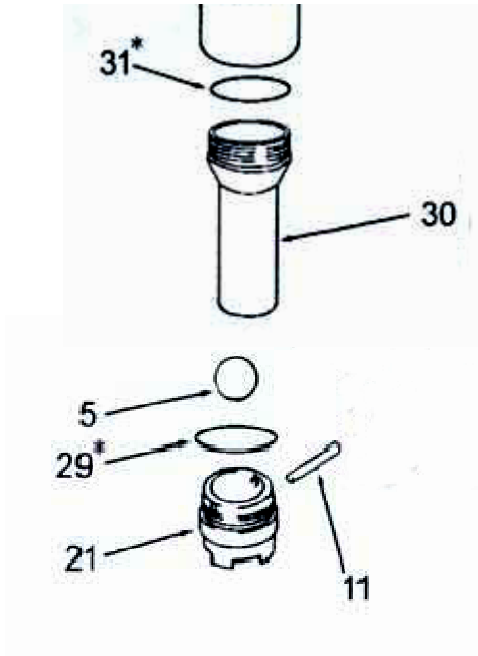
PART LETTER	NEW PART NUMBER	OLD PART NUMBER	DESCRIPTION	QTY	
AJ	700013	OP231A-1-25	Pump Shaft (OP232C ONLY)	1	
			(Includes BA, BB, & BC)		
	700010	OP241A-1-25	Pump Shaft (OP242A & OP242CD)	1	
			(Includes BA, BB, & BC)		
AK	500065	OP231A-1-3	Mat'l. Piston Valve Housing	1	
AL	500071	OP231A-1-31	Foot Valve Housing	1	
AM	500060	OP231A-1-9	U-Cup Retaining Collar	1	
AN	500026	OP232-1-15	Spring	1	
*	AP	500023	OP232-1-18	O-Ring	1
	AQ	700005	OP232-1-19	Displacement Plunger	1
	AR	500007	OP232-1-2	Air Cylinder	1
	AS	500001	OP232-1-20	Press Relief Screw	1
	AT	500005	OP232-1-22	Compression Spring	1
	AU	500020	OP232-1-9	Plunger Top	1
	AV	700001	OP232A-1-1	Air Cylinder Cap	1
	AW	700004	OP237A	Air Motor Assembly	1
	AX	500068	OP601-1-2	Ball Check	2
	AY	500069	OP601-1-3	Snap Ring	1
	AZ	500070	OP601-1-4	Snap Ring	1
	<i>Not Shown:</i>				
	BA	500056	9435-24	O-Ring	1
	BB	500054	OP232-1-24	Roll Pin	1
*	BC	500055	OP232-1-29	Roll Pin	1
	BD	500072	OP232-1-14	Spanner Pin	2
*	BE	T200001	15841	Loctite Sample	1

* Included in the **2:1 Rebuild Kit** (part #OP232-50). Order from your local distributor

** The **pump body** also includes the **pump pressure cylinder** (IPOP231-1-11-5).

*** **Note:** Letter "K" is also available in Nylon material (Part #OP200-2-2-2N)

6.2 OP-242 CD Lower Section Pump Inlet



Reference Number	New Part Number	Old Part Number	Part Description	Qty.
5	500269	02-101-917	Ball Intake valve	1
11	500264	02-164-250	Pin, ball stop	1
21	500265	02-164-251	Housing intake valve	1
29	500237	02-990-032	O-Ring	1
30	500258	02-990-041-6	Cylinder	1
31	5000059	02-990-038	O-Ring	1

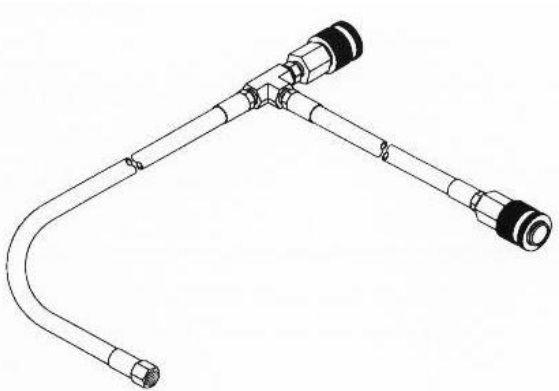
7.0 OPTIONAL PARTS

New Part Number	Old Part Number	Part Description
500088	OP238	Tote Extension
TBA	OP231-32X	Pipe Ext. Adaptor



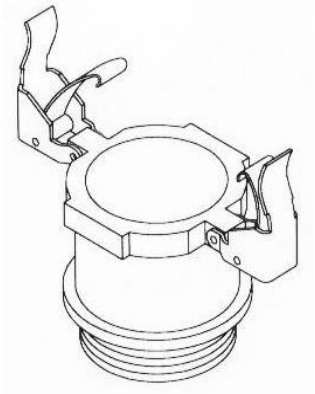
TRANSFER PUMP AIR HOSE ASSEMBLY

NEW PART NUMBER	OLD PART NUMBER
609007	OP234-F
609008	OP234-H



BUNG ADAPTOR

NEW PART NUMBER	OLD PART NUMBER
700008	OP233A



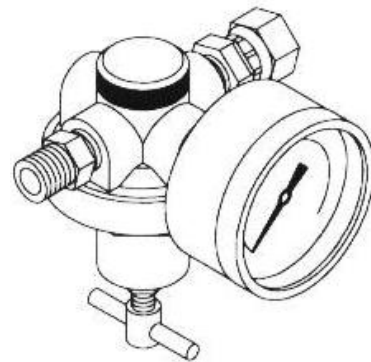
FELT WIPER

NEW PART NUMBER	OLD PART NO.	DESCRIPTION
500187	N/A	Felt Wiper



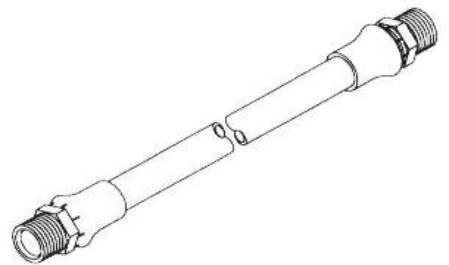
0-100 PSI PRESSURE
REGULATOR WITH GAUGE

NEW PART NUMBER	OLD PART NO.	DESCRIPTION
602002	OP235	1/4" NPT Inlet 1/4" NPT (F) /Swivel Outlet



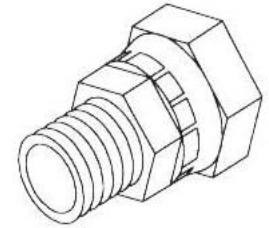
MATERIAL SUPPLY HOSES

NEW PART NO.	OLD PART NUMBER	DESCRIPTION
609017	OP6157A-A-10	3/4 x 10' A Supply Hose (1/2 NPT)
609012	OP6157A-10	3/4 x 10' R-Supply Hose(3/4 NPT)
609011	OP5157-A	1" x 10' A-Supply Hose(3/4 NPT)
609010	OP5157	1" x 10' R-Supply Hose(1 NPT)



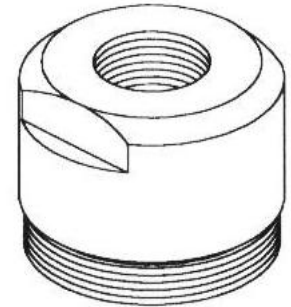
SWIVEL UNIONS

NEW PART NO.	OLD PART NUMBER	DESCRIPTION
610006	OP179-6	1/2 NPT x 1/2 NPT (F)
610004	10420	1/2 NPT x 3/4 NPT (F)
610005	OP156-33	3/4 NPT x 1/2 NPT (F)
610001	1433A-3	3/4 NPT x 3/4 NPT (F)
610013	OP5151-7	3/4 NPT x 1" NPT (F)
610018	5483-3	1" x 3/4 NPT (F)
610019	5433-3	1" x 3/4 NPT (F)



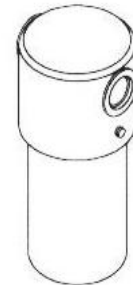
FOOT VALVE

NEW PART NO.	OLD PART NUMBER	DESCRIPTION
500098	OP231-1-32	3/4 NPT (F)



AIR CLEANER

NEW PART NO.	OLD PART NO.	DESCRIPTION
602003	571A	1/4 NPT (F) Inlet & Outlet



8.0 Technical Data

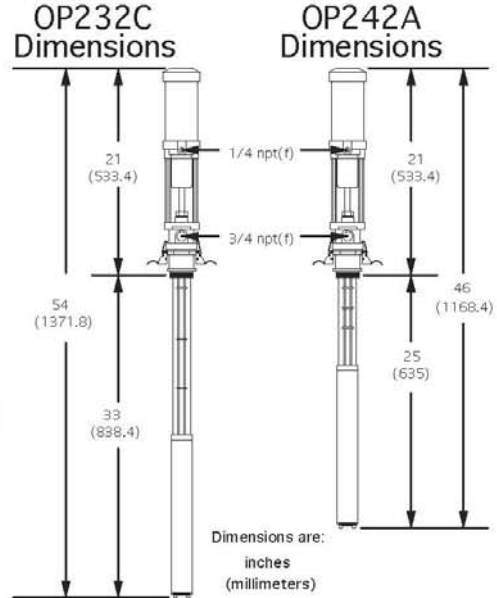
OP232C Air Operated Fluid Pump



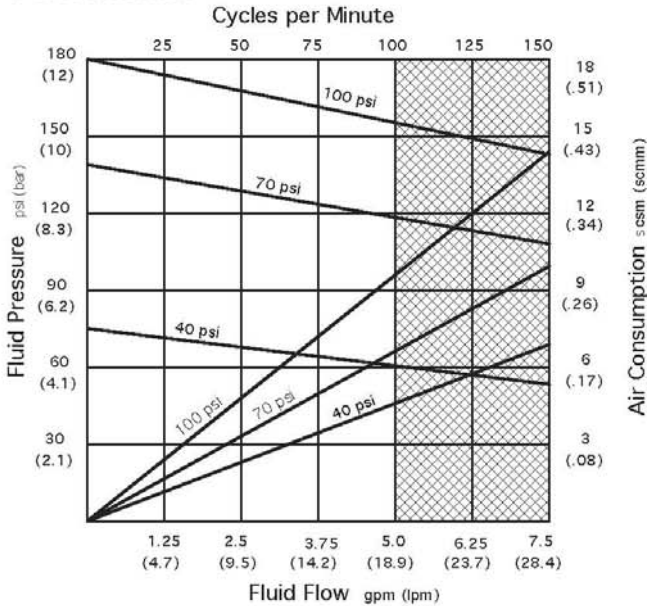
Divorced Design

Technical Specifications

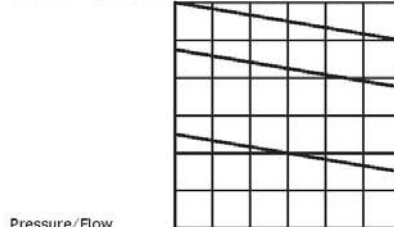
Fluid Ratio.....2:1
 Maximum Output Flow (intermittent).....7.5 gpm (28.4 lpm)
 Maximum Output Flow (continuous).....5.0 gpm (18.9 lpm)
 Maximum Output Pressure.....360 psi (24.8 bar)
 Maximum Air Input Pressure.....180 psi (12.4 bar)
 Air Inlet Port.....1/4 npt(f)
 Fluid Outlet Port.....3/4 npt(f)
 Rod & Piston Packings.....UHMW PE or Teflon®
 Other Seals.....Viton®
 Rod & Cylinder.....Stainless Steel
 Other Wetted Parts.....Stainless Steel
 Weight.....24 lbs. (11.8 Kg.)
 Package Dimensions & Weight:
 OP232C...6"x6"x58"(152mm x 152mm x 147cm) 26 lbs. (11.8 Kg.)
 OP242A...6"x6"x50"(152mm x 152mm x 127cm) 26 lbs. (11.8 Kg.)



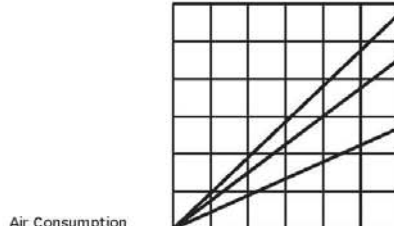
Performance



How to Read Performance



- Pressure/Flow**
1. Locate required flow along bottom edge of chart.
 2. Follow vertically to bold line for input air pressure.
 3. Follow horizontally to left edge of chart to read maximum available fluid pressure.



- Air Consumption**
1. Locate fluid flow along bottom edge of chart.
 2. Follow vertically to bold line for input air pressure.
 3. Follow horizontally to right edge of chart to read air consumption.

Model Numbers

Bare Pump Model Number: # OP232C, OP242A, OP242CD
 Bung Adapter: #OP233A*
 *One supplied with pump. Additional adapters can be used in new material drums for minimal interruption of operation during drum change-over.
 Adapters have internal seal to allow nitrogen charge or prevent moisture contamination. Toggle clamps provide quick slip-out/slip-in pump changes.

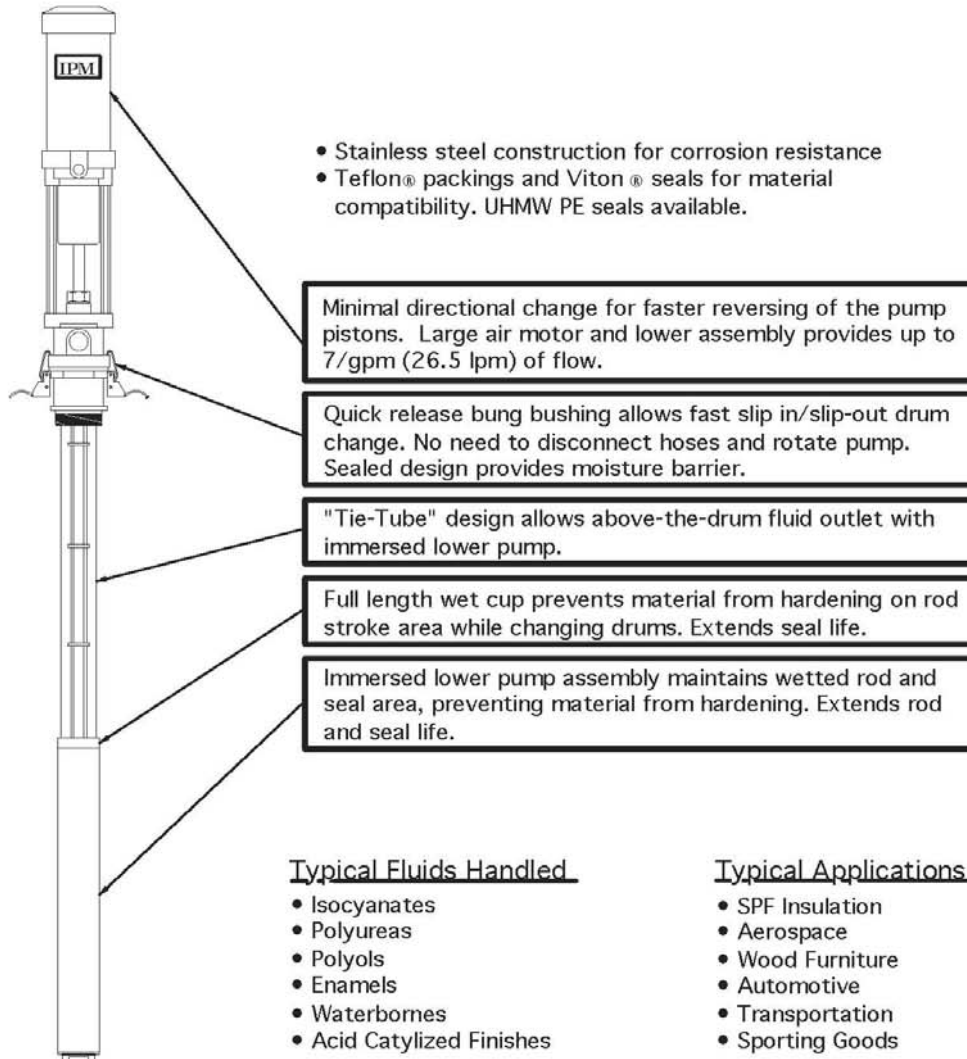
IFP 101 0608

200 Series OP232C Air Operated Fluid Pump



Divorced Design

IPM's OP232C is designed specifically for difficult to handle materials. The immersed lower pump, tie-tubes, and quick release bung bushing allow quick drum change without exposing the system to contamination and moisture.



IPM International Pump Manufacturing
 Phone: 253-863-2222 FAX: 253-863-2223
 Web: www.ipmpumps.com

3107 142nd Av. E. # 106
 Sumner, WA 98390

9.0 WARRANTY

IPM provides a limited warranty to the original purchaser (Customer) of IPM manufactured parts and equipment (Product) against any defects in material or workmanship for a period of one year from the date of shipment from IPM facilities.

In the event Product is suspected to be defective in material or workmanship, it must be returned to IPM, freight prepaid. If product is found to be defective in material or workmanship, as determined solely by IPM, IPM will issue full credit to Customer for the freight charges incurred in returning the defective Product, and either credit will be issued for the replacement cost of the Product or a replacement part will be forwarded no-charge, freight prepaid to Customer.

This warranty shall not apply Product IPM finds to be defective resulting from: installation, use, maintenance, or procedures not accomplished in accordance with our instructions; normal wear; accident; negligence; alterations not authorized in writing by IPM; or Product Use in conjunction with any other manufacturer's pumping or proportioning equipment. Further, the terms and conditions of this warranty shall not apply to services or repairs made to Product by any third party not authorized in writing by IPM. For such Product, a written estimate will be submitted to Customer, except as approved in writing by IPM at a nominal service charge, itemizing the cost for repair. Disposition of Product will be done in accordance with the terms stated on the written estimate.

The warranty provisions applied to Product that are not manufactured by IPM will be solely in accordance with the warranty provided by the original manufacturer of the Product.

IPM MAKES NO WARRANTY WHATSOEVER AS TO THE MERCHANTABILITY OF, OR SUITABILITY FOR, IT'S PRODUCT TO PERFORM ANY PARTICULAR PURPOSE. CREDIT FOR, OR REPLACEMENT OF, PRODUCT DEFECTIVE IN MATERIAL OR WORKMANSHIP SHALL CONSTITUTE COMPLETE FULFILLMENT OF IPM OBLIGATIONS TO CUSTOMER. NO OTHER WARRANTY, EXPRESSED OR IMPLIED ON ANY PRODUCT IT MANUFACTURES AND/OR SELLS, WILL BE RECOGNIZED BY IPM UNLESS SAID WARRANTY IS IN WRITTING AND APPROVED BY AN OFFICER OF IPM.

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