

Price® Pump Co.



INSTALLATION, OPERATING AND MAINTENANCE MANUAL

AIR OPERATED DIAPHRAGM PUMPS MODEL: AOD .5-Y ALL ELASTOMERS

PLEASE FILL IN DATA
FROM YOUR PUMP
NAMEPLATE

RETAIN MANUAL

FOR REFERENCE

Pump Model_____

Spec. No._____

Serial No._____

Seal No.____

Price® Pump Company P.O.Box Q Sonoma, CA 95476 Tel: 707-938-8441

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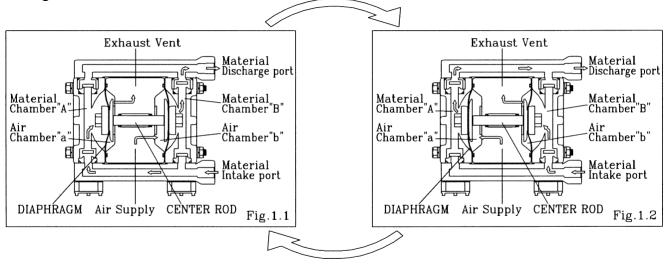
Email: sales@pricepump.com

Table of Contents

Warnings and Cautions	
Table of Contents	2
1. Principle of operation	3
2. Tools, etc.	
2.1 General tools	3
2.2 Special Tool	3
2.3 Misc	3
3. Ordering Replacement Parts	3
4. Balls, Flat valves and Valve Seats	
4.1 Removal	
BA, BS types	4
4.2 Inspection	5
Ball Valve types	
4.3 Installation	5
5. Diaphragm and Center rod	
5.1 Removal	
BA_, BS_ types	6
5.2 Inspection	
5.3 Installation	
B_S types	7
B C, B N, BAT types	
6. Pilot valve assembly, Guide bushing	
6.1 Removal	8
6.2 Inspection	8
6.3 Installation	8
7. C Spool valve assembly and Sleeve Assembly	
7.1 Removal	9
7.2 Installation	
8. Exploded View and Parts List	
8.1 Exploded View	10
8.2 Parts List	11
8.3 Parts List, Body assembly	12

1. Principles of operation

There are two diaphragms fixed to the center rod, one at each end. When compressed air is supplied to air chamber b (right side, see Fig. 1.1), the center rod moves to the right, the material in material chamber B is pushed out, and at the same time material is sucked into material chamber A. When the center rod is moved full-stroke to the right, the air switch valve is switched, compressed air is sent to air chamber a (left side, see Fig. 1.2), and the center rod moves to the left. The material in material chamber A is pushed out, and at the same time material is sucked into material chamber B. Through repetition of this operation, material is repeatedly taken in and discharged out.



2. Tools, etc.

2.1 General tools

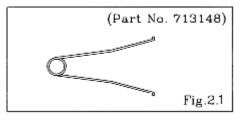
• Socket wrenches 13 mm

• Open-end wrenches 13 mm, 21 mm

Pliers

2.2 Special tool

• Sleeve remover (sold separately)
Purpose: For removing sleeves



2.3 Misc.

Assembly oil Turbine oil none addition class 1 (equivalent ISO VG32 grade)

Nuts M 8x1.25

3. Ordering Replacement parts

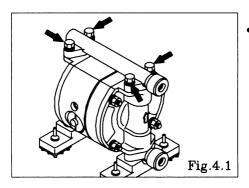
For accurate and speedy shipment of parts, be sure to order the right parts for your model to your distributor. Indicate the part numbers, descriptions and quantities.

4. Balls, Flat valves and Valve Seats

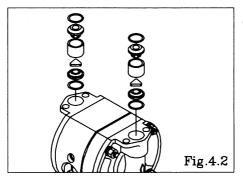
4.1 Removal

BA_, BS_ types

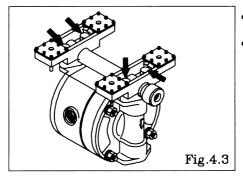
See [8. Exploded View] on after p.10 (Fig. 4.1, 4.2, 4.3 and 4.4 show the AOD .5-Y).



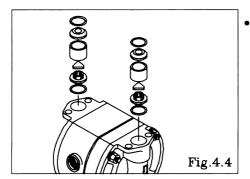
• Remove the 4 retainer bolts from the out manifold, and remove the out manifold. [Fig. 4.1]



Remove the O ring, valve guide, ball and valve seat. [Fig. 4.2]

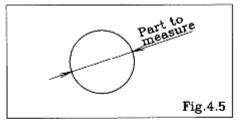


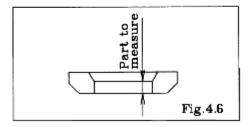
- Turn over the main body assembly. [Fig. 4.3]
- Remove the 4 retainer bolts from the in manifold, and remove the in manifold. [Fig. 4.3]



Remove the O ring, valve seat, ball and valve guide. [Fig. 4.4]

4.2 Inspection Ball valve type





• Ball [Fig. 4.5]

Measure the outside diameter, and if it is outside the usable range, replace the ball.

Usable range of ball

$$S_{\emptyset}0.787 \sim S_{\emptyset}0.898$$
 in $\{S_{\emptyset}20.0 \sim S_{\emptyset}22.8mm\}$

• Valve seat [Fig. 4.6]

Measure the dimension shown at left, and if it is outside the usable range, replace the seat.

Usable range of valve seat

$$0.102 \sim 0.256$$
 in $\{2.6 \sim 6.5 \text{ mm}\}$

• O ring (other than PTFE)
If O rings are worn out or cracked, replace them.

4.3 Installation

For installation, see [8. Exploded View] on after p.10, and install in the reverse order of disassembly.

Tightening torque for manifold retainer bolts or nuts

<NOTE>

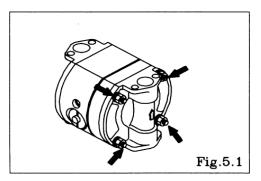
- Make sure there is no dust on the seal surface and the seal is not damaged.
- Replace the PTFE O ring regardless of its condition.

5. Diaphragm and Center rod

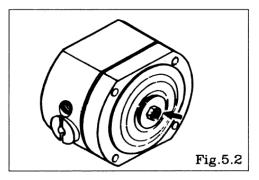
5.1 Removal

BA, BS types

See [8. Exploded View] on after p.10 (Fig. 5.1, 5.2 and 5.3 show the AOD .5-Y).



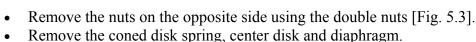
- Remove the ball and flat valve and valve seat (see [4.1 removal BA, BS types] on p.4).
- Remove the 12 retainer bolts from the out chamber, and remove the out chamber. [Fig. 5.1]

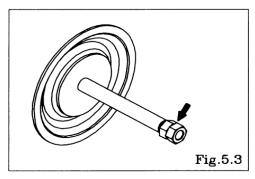


- Remove the nuts on both sides of the center rod. [Fig. 5.2]
- After the nuts on one side have been removed, remove center disk and diaphragm. Remove the diaphragm, center disk and center rod from the opposite side of the main body.

<NOTE>

• When the diaphragms are removed, the main body is separated in 2 pieces. For easy work, leave the tie rods or bolts fastened temporarily before removing the diaphragms.





5.2 Inspection

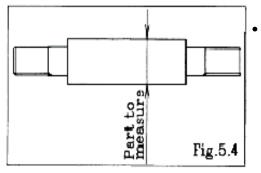
Diaphragm

If the Diaphragm is worn out damaged, replace it. New replace just one diaphragm.

Guideline of diaphragm (estimated) life

CR,NBR, PTFE	10,000,000 Cycles
TPEE, TPO	15,000,000 Cycles

(When used with clean water at room temperature)



Center rod [Fig. 5.4] Measure the diameter, and if it is outside the usable range, replace the rod.

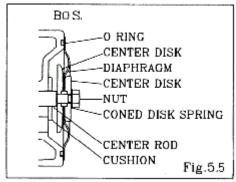
Usable range of center rod

 $_{\varnothing}0.5496 \sim _{\varnothing}0.5512 \text{ in } \{_{\varnothing}13.96 \sim _{\varnothing}14.00 \text{ mm}\}$

5.3 Installation

B S types

For installation, see [8. Exploded view] on after p.10, and install in the reverse order of disassembly.



- Apply assembly oil to the center rod, and insert it into the main body.
- Keep the convex side to the outside.
- Tighten the out chamber temporally at first.
- After installation of the out chambers on both sides, place the pump on a flat surface and stand the pump upright for further assembly.

Tightening torque for center rod and out chamber.

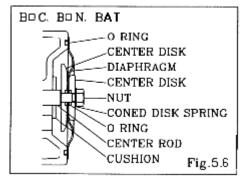
105 lbf·in {120 kgf·cm}

<NOTE>

- Make sure there is no dust on the seal surface in order to prevent seal from being damaged.
- Tighten the bolts that balance should be equal from both sides on diagonal line with even torque.

B C, B N, BAT types

For installation, see [8. Exploded view] on after p.10, and install in the reverse order of disassembly.



- Apply assembly oil to the center rod, and insert it into the main body.
- Keep the marking "LIQUID" to liquid end for CR, NBR diaphragms.
- Keep the convex side to the outside for PTFE diaphragms.
- Install the O ring (cf. Fig. 5.6).
- After installation of the out chambers on both sides, place the pump on a flat surface and stand the pump upright for further assembly.

Tightening torque for center rod and out chamber.

105 lbf·in {120 kgf·cm}

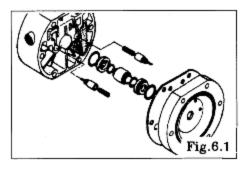
<NOTE>

- Make sure there is no dust on the seal surface in order to prevent seal damaged.
- Replaces the PTFE O ring with new.
- Tighten the bolts that balance should be equal from both sides on diagonal line with even torque.

6. Pilot valve assembly, Guide and Bushing

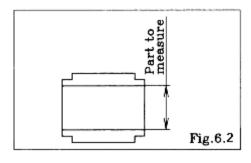
6.1 Removal

See [8. Exploded view] on after p. 10.



- Remove the diaphragm and center rod etc. (see [5.1 removal] on p.6).
- Remove body B. [Fig. 6.1]
- Draw out the pilot valve assembly. [Fig. 6.1]
- Remove the O ring, bushing and guide. [Fig. 6.1]

6.2 Inspection



• Guide [Fig. 6.2]

Measure the inside diameter, and if it is outside the usable range, replace the guide.

Usable range of guide

$$_{\emptyset}0.555 \sim _{\emptyset}0.559 \text{ in } \{_{\emptyset}14.1 \sim _{\emptyset}14.2 \text{mm}\}$$

• O rings

If O rings are worn out or cracked, replace them.

• Pilot valve assembly

If the pilot valve is worn or cracker, replace it.

6.3 Installation

For installation, see [8. Exploded View] on after p. 10, and install in the reverse order of disassembly.

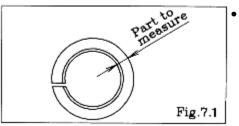
<NOTE>

• Make sure there is no dust on the seal surface and the seal is not damaged.

7. C spool assembly and sleeve assembly

7.1 Checking

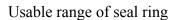
See [8. Exploded View] on after p.10.



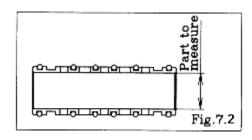
- C spool assembly
 - Seal ring. [Fig. 7.1]

Measure the inside thick diameter, and if it is outside the usable range, replace the C spool assembly.

If the seal ring is worn out or cracked, replace C spool assembly.



 $0.0728 \sim 0.0748$ in $\{1.85 \sim 1.90$ mm $\}$



• Sleeve Assembly [Fig. 7.2] Measure the inside diameter, and if it is outside the usable range, replace the sleeve assembly.

Usable range of Sleeve

 $\emptyset 0.6221 \sim \emptyset 0.6240.$ in $\{\emptyset 15.80 \sim \emptyset 15.85 \text{ mm}\}$

• O rings
If O rings are worn out or cracked, replace them.

<NOTE>

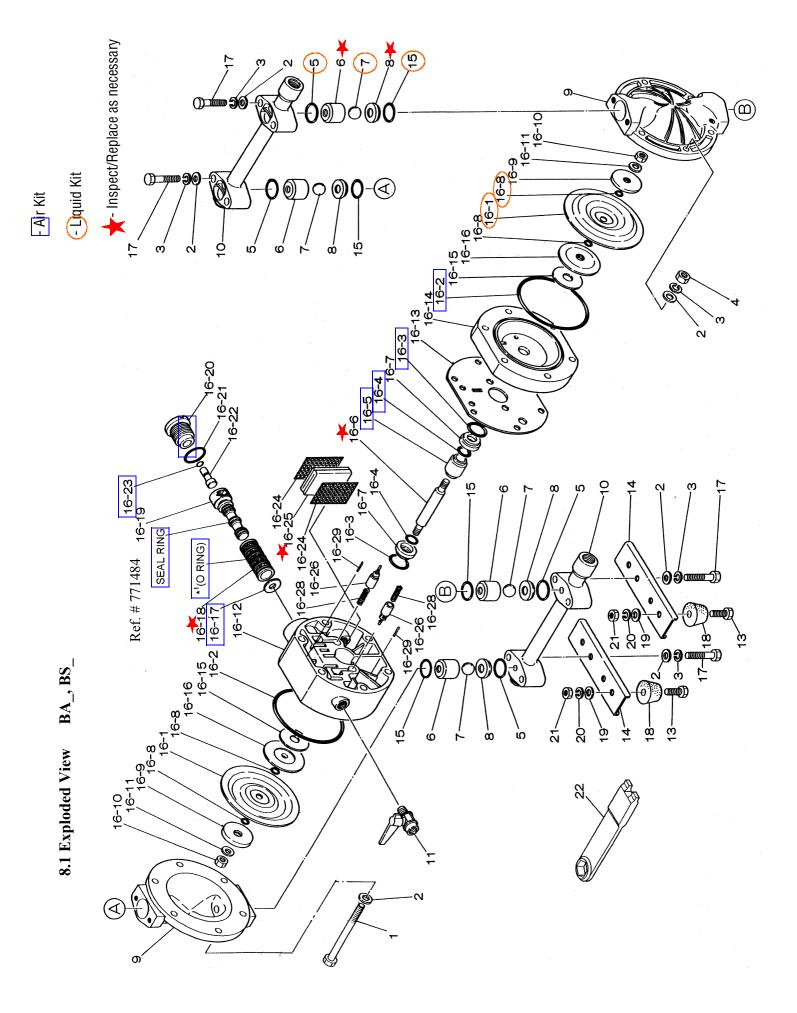
• C Spool assembly and sleeve assembly must be replaced by complete set. Unable to replace individual components.

7.2 Installation

For installation, see [8. Exploded View] on after p.10, and install in the reverse order of disassembly.

<NOTE>

• Make sure there is no dust on the seal surface and it is not damaged.



8.2 Parts List BA_, BS_

NO.	BA_	BS_	DESCRIPTION	QTY	NOTE
1	683171		BOLT	6	M8x1.25x110
1		683224	BOLT	6	M8x1.25x105
2	631329	631329	PLAIN WASHER	20	M8
3	681300	681300	SPRING LOCK WASHER	14	M8
4	628012	628012	NUT	6	M8x1.25
5	TAB. 1	TAB. 1	O'RING	4	
6	771523	711502	VALVE STOPPER	4	
7	TAB. 2	TAB. 2	BALL	4	
8	711227	711382	VALVE SEAT	4	
9	711226	711380	OUT CHAMBER	2	
10	802708		MANIFOLD ASSEMBLY	2	
10		711506	MANIFOLD	2	
11	683055	683055	BALL VALVE	1	1/4"
12	790911	790911	NAME PLATE	1	
13	621102	621102	BOLT	4	M6x1x22
14	711405	711405	BASE	2	
15	TAB. 3	TAB. 3	O'RING	4	
16	TAB. 4	TAB. 4	BODY ASSEMBLY	1	
17	682727		BOLT	8	M8x1.25x60
17		621155	BOLT	8	M8x1.25x40
18	771123	771123	CUSHION	4	
19	631328	621328	PLAIN WASHER	4	M6
20	681855	681855	SPRING LOCK WASHER	4	M6
21	628010	628010	NUT	4	M6x1
22	771132	771132	ACCESSORY TOOL	1	

NOTE) NO.12(NAME PLATE) IS NOT INDICATED IN EXPLODED VIEW

TAB. 1 O'RING (P-26)

TYPE	BA/BS_	MATERIAL
B_C	640025	NBR
B_N	640025	NBR
B_T	643025	PTFE
B_S	684114	EPDM

TAB. 3 O'RING (G-25)

TYPE	BA/BS_	MATERIAL
B_C	640130	NBR
B_N	640130	NBR
B_T	643130	PTFE
B_S	684113	EPDM

TAB. 2 BALL

TYPE	BA/BS_	MATERIAL
B_C	771526	CR
B_N	771525	NBR
B_T	771524	PTFE
B_S	771979	EPDM

TAB. 4 BODY ASSEMBLY

TYPE	BA_	BS_
B_C	802979	802984
B_N	802980	802985
B_T	802978	802983
B_S	803506	803507

8.3 Parts List BODY ASSEMBLY

	BA	BS			
NO.	802978 802979 802980 802981 803506	802983 802984 802985 902986 803507	DESCRIPTION	QTY	NOTE
16-1	TAB. 1	TAB. 1	DIAPHRAGM	2	
16-2	640144	640144	O'RING	2	G-95 NBR
16-3	640020	640020	O'RING	2	P-22A NBR
16-4	640013	640013	O'RING	2	P-14 NBR
16-5	771337	771337	GUIDE	1	
16-6	710578	710578	CENTER ROD	1	
16-7	771336	771336	BUSHING	2	
16-8	TAB. 2	TAB. 2	O'RING	4	
16-9	708770	708506	CENTER DISK	2	
16-10	681849	681849	NUT	2	M8x1.25
16-11	681880	681880	CONED DISK SPRING	2	M8
16-12	780029	780029	BODY A	1	
16-13	771347	771347	GASKET	1	
16-14	780030	780030	BODY B	1	
16-15	771342	771342	CUSHION	2	
16-16	771344	771344	CENTER DISK	2	
16-17	771483	771483	CUSHION	1	
16-18	683089	683089	SLEEVE ASSEMBLY	1	*1 (683123)
16-19	802835	802835	C SPOOL VALVE ASS'Y	1	
16-20	771695	771695	CAP	1	
16-21	640022	640022	O'RING	1	P-24 NBR
16-22	771350	771350	RESET BUTTON	1	
16-23	640002	640002	O'RING	1	P-5 NBR
16-24	771589	771589	MESH	2	
16-25	771465	771465	SILENCER	1	
16-26	832141	832141	VALVE GUIDE ASS'Y	2	
16-28	710577	710577	SPRING	2	
16-29	632752	632752	SPRING PIN	2	Ø2x8

TAB. 1 DIAPHRAGM

TYPE	BA/BS_	MATERIAL
B_C	770971	CR
B_N	770973	NBR
B_T	770933	PTFE
B_S	771972	TPO

TAB. 2 O'RING (P-8)

TYPE	BA/BS_	MATERIAL
B_C	640005	NBR
B_N	640005	NBR
B_T	643005	PTFE
B_S		

B

GENERAL TERMS OF SALE FOR PRODUCTS

1. GENERAL

A. Seller's price is based on these sales terms and conditions. This contract shall represent the final, complete and exclusive statement of the agreement between the parties and may not be modified supplemented, explained or waived by parole evidence, any Terms and Conditions contained in Buyer's purchase order or request for quotation, any course of dealings between the parties, Seller's performance or delivery, or in any other way. The Terms and Conditions of this contract may only be modified or waived in a written document signed by an Officer of Seller. These terms are intended to cover all activity of Seller and Buyer hereunder, including sales and use of products, parts and work and all related matters (references to products include parts and references to work include construction, installation and start-up). Any reference by Seller to Buyer's specifications and similar requirements are only to describe the products and work covered hereby and no warranties or other terms therein shall have any force of effect. Any information provided by Seller including, but not limited to, suggestions as to specific equipment does not imply any guarantee of specific suitability and/or material compatibility in a particular application, since many factors outside the control of Seller may affect the suitability of products in a particular application. Catalogs, circulars, similar pamphlets and information contained on websites of the Seller are issued for general information purposes only and shall not be deemed to modify the provisions hereof.

B. The agreement formed hereby and the language herein shall be construed and enforced under the Uniform Commercial Code as in effect in the State of California on the date hereof.

2. <u>TAXES</u>

Any sales, use or other similar type taxes imposed on this sale or on this transaction are not included in the price. Such taxes shall be billed separately to the Buyer. Seller will accept a valid exemption certificate from the Buyer if applicable; however, if an exemption certificate previously accepted is not recognized by the governmental taxing authority involved and the Seller is required to pay the tax covered by such exemption certificate. Buyer agrees to promptly reimburse Seller for the taxes paid.

3. PERFORMANCE, INSPECTION AND ACCEPTANCE

A. Unless Seller specifically assumes installation, construction or start-up responsibility, all products shall be finally inspected and accepted within thirty (30) days after arrival at point of delivery. Where seller has responsibility for installation, construction or start-up all work shall be finally inspected and accepted with thirty (30) days after completion of the applicable work by Seller. All claims whatsoever by Buyer, (including claims for shortages) except only those provided for under the WARRANTY AND LIMITATION OF LIABILITY and PATENTS Clauses, hereof, must be asserted in writing by Buyer within said thirty (30) day period or they are waived. If this contract involves partial performance, all such claims must be asserted within said thirty- (30) day period for each partial performance. There shall be no revocation of acceptance. Rejection may be only for defects substantially impairing the value of products or work and Buyer's remedy for lesser defects shall be those provided for under the WARRANTY AND LIMITATION OF LIABILITY Clause.

B. Seller shall not be responsible for non-performance or for delays in performance occasioned by any causes beyond Seller's reasonable control, including, by way of example and not limitation, to labor difficulties, delays of vendors or carriers, fires, governmental actions, or shortages of material, components, labor, or manufacturing facilities. Any delays so occasioned shall affect a corresponding extension of Seller's performance dates, which are, in any event, understood to be approximate. IN NO EVENT SHALL BUYER BE ENTITLED TO INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR LATE PERFORMANCE OR FOR A FAILURE TO PERFORM. Seller reserves the right to make partial shipments and to ship products, parts or work which may be completed prior to the scheduled performance date.

C. In the event that Seller has agreed to mount motors, turbines, gears, or other products which are not manufactured by Seller and which are not an integral part of Seller's manufactured product, and a delay in the delivery of such products to Seller occurs that will cause a delay in Seller's performance date, Seller reserves the right to ship its product upon completion of manufacture and to refund an equitable portion of the amount originally included in the purchase price for mounting without incurring liability for non-performance.

D. Seller reserves to itself the right to change its specifications, drawings and standards if such changes will not impair the performance of its products, and parts, and further that such products, and parts, will meet any of Buyer's specifications and other specific product requirements which are a part of this agreement.

E. The manufacture and inspection of products and parts shall be to Seller's Engineering and Quality Assurance standards, plus such other inspections or tests of documentation as are specifically agreed to by Seller. Requirements for any additional inspection, tests, documentation, or Buyer witness of manufacture, test, and/or inspection shall be subject to additional charges.

4. TITLE AND RISK OF LOSS

Title and risk of loss shall pass to buyer upon delivery of products at the designated "Ex Works" as defined by Incoterms, unless other wise agreed by the parties.

5. EROSION AND CORROSION

It is specifically understood that products and parts sold hereunder are not warranted for operation with erosive or corrosive fluids. No product or part shall be deemed to be defective by reason of failure to resist erosive or corrosive action of any fluid and Buyer shall have no claim whatsoever against Seller therefore.

6. BUYERS RESPONSIBILITY

The design specifications of the equipment require the operation of the equipment within certain parameters and may call for the use of speed controls, safety devices, set points or other control devices to insure that the operation remains within design parameters. Buyer agrees and understands that the equipment must be operated and maintained within design specifications.

7. WARRANTY AND LIMITATION OF LIABILITY.

A. Seller warrants only that its product and parts, when shipped, will be free from defects in materials and workmanship. All claims for defective products or parts under this warranty must be made in writing immediately upon discovery and, in any event, within two (2) years of shipment by seller and all claims for defective work must be made in writing immediately upon discovery. Defective items must be held for Seller's inspection and returned to the sellers' point of original shipment upon request. UNAUTHORIZED DISASSEMBLY OR TAMPERING WITH ANY PRODUCT OR COMPONENT MAY VOID ITS WARRANTY.

THE FOREGOING IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES WHATSOEVER, EXPRESS, IMPLIED AND STATUTORY, INCLUDING WITHOUT LIMITATION, THE IMPLIED, WARRANTIES OF MERCHANTABILITY AND FITNESS.

B. ANY PRODUCT (S) SOLD HEREUNDER WHICH ARE NOT MANUFACTURED BY SELLER ARE NOT WARRANTED BY SELLER and shall be covered only by the express warranty, if any, of the manufacturer thereof. With respect to products and parts not manufactured by Seller, Seller's only obligation shall be to assign to Buyer, to the extent possible, whatever warranty Seller obtains from the manufacturer.

C. Upon Buyer's submission of a claim as provided above and its substantiation, Seller shall at its option either (i) repair or replace its product, part or work at the original place of shipment, or (ii) refund an equitable portion of the purchase price.

D. THE FOREGOING IS SELLER'S ONLY OBLIGATION AND BUYER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY AND, EXCEPT FOR THE REMEDIES PERMITTED UNDER THE PERFORMANCE, INSPECTION AND ACCEPTANCE AND THE PATENTS CLAUSES HEREOF, THE FOREGOING IS BUYER EXCLUSIVE REMEDY AGAINST SELLER FOR ALL CLAIMS ARISING HEREUNDER OR RELATING HERETO WHETHER SUCH CLAIMS ARE BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY) OR OTHER THEORIES. BUYER'S FAILURE TO SUBMIT A CLAIM AS PROVIDED ABOVE SHALL SPECIFICALLY WAIVE ALL CLAIMS FOR DAMAGES OR OTHER RELIEF, INCLUDING BUT NOT LIMITED TO CLAIMS BASED ON LATENT DEFECTS. IN NO EVENT SHALL BUYER BE ENTITLED TO INDIRECT, SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, NOR FOR DAMAGES FOR LOSS OF USE, LOST PROFITS OR REVENUE, INTEREST, LOST GOODWILL, WORK OR PRODUCTION STOPPAGE, IMPAIRMENT OF OTHER GOODS, INCREASED EXPENSES OF OPERATION, OR THE COST OF PURCHASING REPLACEMENT POWER OR OTHER SERVICES BECAUSE OF SERVICE INTERRUPTIONS. FURTHERMORE, IN NO EVENT SHALL SELLER'S TOTAL LIABILITY FOR DAMAGES OF BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS OR PARTS MANUFACTURED BY SELLER AND UPON WHICH SUCH LIABILITY IS BASED. ANY ACTION ARISING HEREUNDER RELATED HERETO, WHETHER BASED ON BREACH OF CONTRACT TORT (INCLUDING NEGLIGENCE) OR OTHER THEORIES, MUST BE COMMENCED WITHIN ONE (1) YEAR AFTER THE CAUSE OF ACTION ACCRUES OR IT SHALL BE BARRED.

8. PURCHASER'S REPRESENTATIONS & WARRANTIES

Purchaser represents and warranties that the products(s) covered by this contract shall not be used in or in connection with a nuclear facility or application. The parties agree that this representation and warranty is material and is being relied on by seller. This provision may be modified in a separate writing signed by an officer of Price Pump Co.

9. PATENTS

Seller agrees to assume the defense of any suit for infringement of any patents brought against Buyer to the extent of such suit charges infringement of an apparatus or product claim by Seller's product in and of itself, provided (i) said product is built entirely to Seller's design, (ii) Buyer notifies Seller in writing of the filing of such suit within ten (10) days after the service of process thereof, and (iii) Seller is given complete control of the defense of such suit, including the right to defend, settle and make changes in the product for the purpose of avoiding infringement of any process or method claims. Provided however, Seller will not defend any suit for infringement of a claimed patent where such alleged infringement is the result of following specific instruction furnished by Seller.

10. EXTENT OF SUPPLY

Only products as listed in Seller's proposal are included in this agreement. It must not be assumed that Seller has included anything beyond same.

11. MANUFACTURING SOURCES

To maintain delivery schedules, Seller reserves the right to have all or any part of the Buyer's order manufactured at any of Sellers', sellers' licensees or sub contractors' plants, globally.

12. TERMS OF PAYMENT

Net 30 days from date of invoice.

13. ARBITRATION

In the event a dispute arises between the parties relating to or arising out of this agreement, the parties agree to attempt to have their senior management amicably settle the matter. In the event that the matter cannot be settled, the parties shall submit all disputes relating to this Agreement (whether contract, tort, products liability or otherwise) to binding Arbitration before a panel of arbitrators under the Commercial Dispute Resolution Procedures of the American Arbitration Association. Each party shall appoint an arbitrator and the third shall be selected in accordance with the rules of the American Arbitration Association. Judgment upon the award may be entered in any court having jurisdiction. The parties shall cooperate in providing reasonable disclosure of relevant documents. Each party shall bear its own expenses, and the costs and fees of the arbitration shall be borne as allocated by the Arbitrator.