14.0 Warranty

14.1 The warranty period commences on the date of original purchase of the equipment. Evidence of this date of original purchase must be provided when claiming repairs under warranty. It is recommended you retain all receipts in a safe place.

14.2 Shah Pneumatics products are warranted to the original user only to be free of defects in material and workmanship for a period of 12 months from date of manufacture. Shah Pneumatics' liability under this warranty shall be limited to repairing or replacing at Shah Pneumatics' option, without material charge however we may levy service charges, FOB Shah Pneumatics' Mumbai distribution center or authorized service agent. Shah Pneumatics will not be liable for any costs of removal, installation, transport or any other charges that may arise in connection with the warranty claim.

14.3 This warranty is subject to due compliance by the original purchaser with all directions and conditions set out in the Installation and Operating Instructions. Failure to comply with these Instructions, damage or breakdown caused by fair wear and tear, negligence, misuse, incorrect installation, inappropriate chemicals or additives in the water, inadequate protection against freezing, rain or other adverse weather conditions, corrosive or abrasive water, lightning or high voltage spikes or through unauthorized persons attempting repairs are not covered under warranty.

14.4 Shah Pneumatics shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from the product or any defect, and the purchaser shall indemnify Shah Pneumatics against any claim by any other person whatsoever in respect of any such loss, damage or injury.

14.5 This warranty applies to all states and territories of India only.

14.6 For effective warrantee, user must produce copy of invoice / warrantee page / card.

14.7 No warrantee will be given if the above condition are not met with the decision of Flowmatics/Shah Pneumatics in relation of any claims or dispute over the warrantee is final.

Shah Pneumatics has a continuous policy of product development and although the Company reserves the right to change specifications, it attempts to keep customers informed of any alterations. This publication is for general information only and customers are requested to contact our Sales Department for detailed specifications and advice on a product's suitability for specific applications. All products are sold subject to the Company's standard conditions of sale.

WATER MANAGEMENT SYSTEMS

Shah Pneumatics

Regd. Office: 28-30 Navketan Indl. Estate, Mahakali Caves Road, Andheri (East), Mumbai- 400 093. INDIA.
Telephone: +91-22-6695 1090~94. Facsimile: +91-22-2687 5317
Email: shahpneu@bom3.vsnl.net.in
Website: www.shah-pneumatics.com

FOR DISTRIBUTOR STAMP

Publication Reference : **Flowmatics 211/2009 Rev.00**

Flowmatics™

WATER MANAGEMENT SYSTEMS

PP 2 / 4 / 8 SERIES

HORIZONTAL MULTISTAGE STAINLESS STEEL CENTRIFUGAL PUMPS

INSTALLATION OPERATION & MAINTENANCE MANUAL

DEALER: This manual must be given to the user of the pump
USER: Before using this pump, read this entire manual and save for future reference

energy saving

For more information regarding Flowmatics products, parts & services, please visit www.shah-pneumatics.com

WARNING:
1. Periodic inspection and maintenance of pumps is essential
2. Transfer of toxic, dangerous, flammable or explosive substances using Flowmatics products is at user's risk
3. Inspection, maintenance & installation of pumps must be made only by experienced, trained & qualified personnel
4. Use of strainer in the suction of the pump is a must for ensuring longer life of pump

TABLE OF CONTENTS

Congratulations for your purchase of Flowmatics pump / products.

We appreciate your trust while opening/unpacking the product, make sure that there is no transit damage, if any, it must be reported to the dealer.

We take no responsibilities in the case of accidents or damages on the basis of carelessness or disregard to the instructions and reject every responsibilities for the damages which originate from the improper use of the pumps.

The purchaser must correctly fill in and mail the last page within 10 days from the date of purchase. No warrantee will be given for incomplete warrantee.
(provide invoice no./ date / dealers name & add with stamp & signature on last page.)

13.0 Maintenance Record

Purchase Details

Date of Purchase : .....

From: Name : .....
Address : .....
.....
.....
Tel. No. : .....
Fax No. : .....

Pump Details

Pump Model No.: .....

Pump Connection : .....

Installation Details

Date of Installation : .....

Location : .....

Strainer Details

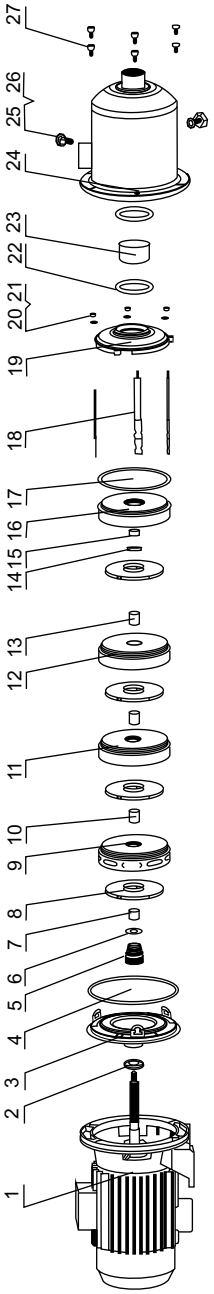
Estimated Date of Strainer Cleaning : .....

Estimated Date of Strainer Change : .....

Bill no. :
Bill date :
Serial No:
Manuf. Dt :

DEALERS STAMP

12.0 Part Explosion Diagram



No.	Part Name	No.	Part Name	No.	Part Name
1	Motor	10	Shaft Sleeve III	19	Front Cover
2	"V" Slinger	11	Diffuser Assembly III	20	Plain Washer
3	Back Cover	12	Diffuser Assembly II	21	Nut
4	"O" Ring	13	Shaft Sleeve I	22	Inner Tube "O" Ring
5	Mechanical Seal	14	Gasket	23	Inner Tube
6	Mechanical Seal Plate	15	Impeller Nut	24	Casing
7	Shaft Sleeve IV	16	Diffuser Assembly I	25	"O" Ring + "L" Washer
8	Impeller IV	17	Gasket	26	Priming / Drain Bolt
9	Diffuser Assembly IV	18	Tension Bar	27	Bolt

1.0 Features

The PP Horizontal Multistage Pumps are manufactured in AISI 304 Stainless Steel sheets by using stamping and welding technologies, which make the pumps have the features of light weight, graceful appearance, material saving, and high efficiency.

2.0 Applications

The pumps are suitable for transporting clean water and industrial media which are non-aggressive to stainless steel AISI 304, such as boiler feeding, clean water lifting, tanks and reservoirs supplying and emptying, gardening and irrigation, etc.

3.0 Model Ordering Code Instructions

PP - 2 - 20 / 37 - D

Series
PP - Horizontal Multistage Centrifugal Pump

Flow
2 - 2 m^3/hr
4 - 4 m^3/hr
8 - 8 m^3/hr

Stages X 10
20 - 2 stage
30 - 3 stage
40 - 4 stage
50 - 5 stage
60 - 6 stage

Motor Power
037 - 0.37 kW
055 - 0.55 kW
075 - 0.75 kW
110 - 1.10 kW
150 - 1.50 kW
220 - 2.20 kW

Phase
D - Single
Blank - Three

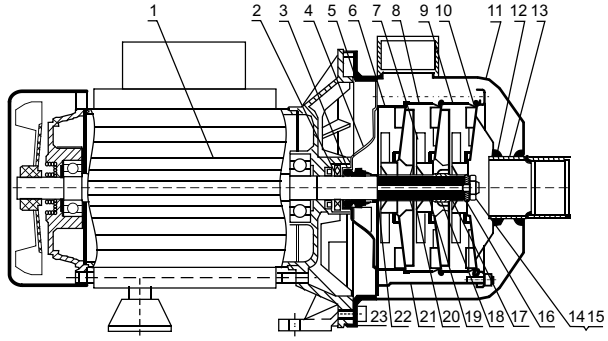
4.0 Working Conditions

4.1 Ambient temperature +40 ^{0}C max.

4.2 Liquid temperature: -15 ~ +80^{0}C

4.3 Maximum working pressure: Upto 8 kg/cm^{2}g

5.0 Structure



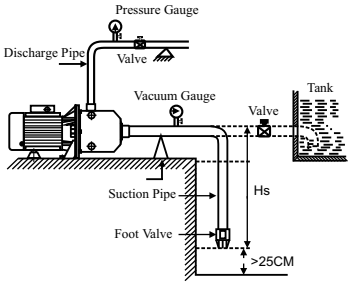
1. Motor
2. Water-proofing
3. Mechanical seal
4. Back cover
5. "O" ring
6. Diffuser III
7. Impeller
8. Diffuser II
9. Diffuser I
10. Diffuser plate
11. Casing
12. "O" Ring
13. Inner Suction Tube
14. Impeller nut
15. Spring washer
16. Shaft sleeve I
17. Shaft sleeve II
18. Bearing sleeve
19. Shaft sleeve III
20. Shaft sleeve IV
21. Diffuser assembly tension bar
22. Spring washer
23. Bolt

6.0 Installing the Pump

6.1 The pump must be installed on a level place, as near as possible to the source of water, away from children's reach .

6.2 To ensure safety, the pump must be installed horizontally in a dry place where is well ventilated and the ambient temperature must not exceed 40 C.

6.3 Sit the pump on the position where the pump is to stand and use bolts and nuts & rubber pad to fix the pump on its feet.



6.4 If the pump is placed on the position that above the water level to pump water, the suction pipe must be stretched at the minimum depth of 50 cm into the water and keep a space of 25 cm from the bottom of the tank to avoid air or sand is drawn in.

6.5 All connections on the suction piping must be sealed entirely and to reduce the length of piping as far as possible to ensure good suction performance.

6.6 To reduce discharge pressure loss use as less as possible elbow connections on the discharge piping and to reduce the length of piping as far as possible.

6.7 All piping must be supported independently, the pump must not stand any weight or force of the piping.

6.8 It is recommended to fix a pressure gauge & non return valve on the discharge pipe and a vacuum gauge on the suction pipe to monitor working conditions of pump.

6.9 It is recommended to fix a pressure gauge and non return valve on the discharge pipe and a vacuum gauge on the suction pipe to monitor working conditions of pump.

7.0 Pump Electrical Connection

7.1 Check voltage, frequency and phase of power source are identical to the corresponding data on the pump nameplate max voltage fluctuation ± 5%.

7.2 A wiring diagram can be seen inside the cover of terminal box. The pump must be effectively earthed in accordance with local electric regulations. It is recommended that earth-leakage protection be provided by connection of a residual current circuit breaker.

8.0 Starting, Operating and Stopping the Pump

8.1 Before using a new pump, run the motor fan by hand to check whether pump is running freely and quietly.

8.2 Start up the pump for a second to check the rotational direction, the correct way is always in anti-clockwise when viewing the motor fan from the motor end.

5.3 Close the discharge valve and open the suction valve, unscrew the filling plug on the top of the pump body and fill the pump body with water until it overflows, then screw the plug back on until it is firmly locked and start up the pump.

8.4 Set the discharge valve to control capacity and outlet pressure to reach to the required duty point.

8.5 Before stopping operation, close the discharge valve, then shut off power.

8.6 Under normal working condition pumps requires no servicing until 2000hrs of operation.

9.0 Attention

9.1 It is strictly forbidden to operate the pump without water inside the pump body.

9.2 Avoid frequent starting and stopping of the pump. Switch off the pump if the power is interrupted.

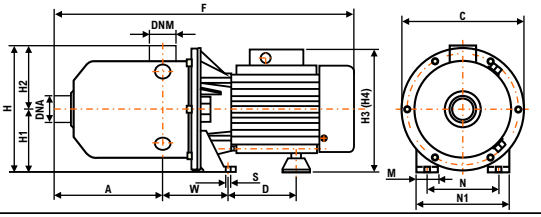
9.3 It is forbidden to control capacity by setting the valve on the suction pipe.

9.4 Switch off power when the pumped water is interrupted or there is lack of water.

9.5 If strange noise made by the pump are heard, stop pumping immediately and check the cause.

9.6 When the pump is to remain inactive for a long period, drain the water from the pump body by unscrewing the draining plug and filling plug. Wash the pump body with clean water and make sure the pump body is completely drained to avoid breakage by frozen water in winter times.

10.0 Outline Diagram & Dimensions



Model	Dimensions (mm)																Weight Kg.
	A	C	F	H	H1	H2	H3*	H4*	M	N	N1	S	W	D	DNA	DNM	
PP 2-20/037D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	7.7
PP 2-30/055D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	8.8
PP 2-40/055D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	9.4
PP 2-50/055D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	9.6
PP 2-60/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	25(G1")	25(G1")	10.8
PP 4-20/055D	76	170	400	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	8.6
PP 4-30/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	9.4
PP 4-40/075D	130	170	454	176	88	88	180	180	30	100	130	7	91	92	32(G1¼")	25(G1")	9.6
PP 8-20/075D	137	235	470	250	120	130	250	250	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-30/110D	137	235	470	250	120	130	250	250	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-40/150D	197	235	536	250	120	130	260	260	39	140	180	9	104	82	38(G1½")	38(G1½")	22
PP 8-50/220D	197	235	536	250	120	130	260	260	39	140	180	9	104	82	38(G1½")	38(G1½")	22

NOTE: H3 : For Single Phase ; H4 : For Three Phase ; For 3 phase input voltage, remove (D) in Model code

11.0 Troubleshooting

Trouble	Possible cause	Remedy
1. No water is pumped out.	1. Too low liquid lever. 2. Suction/discharge pipes or impeller is blocked. 3. Pipe connection leakage.	1. Reinstall; reduce the distance from the pump to the liquid lever. 2. Clean pipes and the volute. 3. Seal the connections.
2. Insufficient capacity.	1. Suction/discharge pipes is blocked 2. Sealing ring damaged or corroded. 3. Motor runs at low speed.	1. Clean pipes and the pump. 2. Replace the sealing ring. 3. Check the input voltage.
3. Too low head	1. Too high liquid temperature or air cavity occurs. 2. Wrong rotational direction. 3. Impeller damaged.	1. Lower the water temperature and fill up the pump body with water. 2. Correct electric connections (for three phase only}) 3. Replace the impeller.
4. Overload (motor gets heat)	1. Too big capacity (pump operates beyond its performance limit.) 2. Mechanical friction. 3. Input voltage too low or motor fan damaged.	1. Check the pump model is correct, or make the pump to work within its performance limit by setting the discharge valve. 2. Check the cause and clean it up. 3. Raise up input voltage or replace motor fan.
5. Pump leakage	1. Mechanical seal damaged. 2. "O" ring damaged.	1. Replace mechanical seal. 2. Replace "O" ring.
6. Motor vibrates and makes noise or shaft heats.	1. Motor bearings damaged or lack of lubrication. 2. Base not firmly fixed.	1. Adjust the concentricity between motor and pump body, replace or clean bearings and lubricate with grease. 2. Place motor on the level and tighten up each screw on the base.
7. Pump makes noise	1. Too big capacity and air cavity occurs. 2. Screws loose.	1. Check the pump model is correct or reduce capacity by setting discharge valve. 2. Tighten up the screw.