June/2018-19/L6/3000

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SHAKTI PUMPS (INDIA) LIMITED

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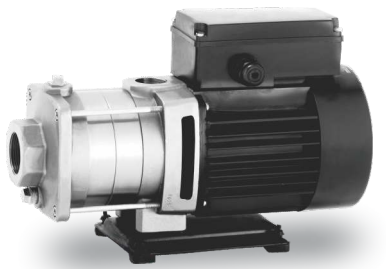
SHAKTI

PUMPING LIFE

INSTALLATION & OPERATING INSTRUCTIONS



PRESSURE BOOSTER PUMPS

SH, SHI, SHN SERIES

CE

EC DECLARATION OF CONFORMITY
IN ACCORDANCE WITH LV & EC MACHINERY DIRECTIVES UNDER SELF DECLARATION

Product Designation	:	Horizontal Multistage centrifugal Pump set
Model Reference	:	SH/SHI/SHN 2-12 (Max. - 3.0 hp)
Intended End Use	:	This is used for pumping of water and water and other thin, non aggressive and non explosive liquids, not containing solid particles or fiber any other applications This product is not use in potential explosive environment

Conforming to the requirement of following European Directives:
a) Low Voltage Directive : 2006/95/EC
b) EC Machinery Directive : 2006/42/EC

Applicable Harmonized Standards:
EN ISO 12100-2010, EN 809: 1998+A1:2009, EN 60335-1, EN 60335-2-41

We hereby declare that Horizontal Pressure Booster Pump set is indented to be incorporated into or assembled with other machinery to constitute relevant machinery to comply with the essential Health and Safety requirement of the mentioned directives.

This machinery, its components and sub assemblies shall not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provision of the applicable directives.

The criteria for selection, safety requirement of other associated equipment and installation guide lines are detailed in the instruction manual.

- Date of Manufacturer & First CE marking : 05 Nov 2017
- Place of Manufacturer : Shakti Pumps India Ltd. ,Pithampur

Issued at: SHAKTI PUMPS (India) Limited, Pithampur

Marking: CE

The above pump set must not put into service /usage for other than specified in the instruction Manual Date: 05 Nov 2015

INSTALLATION AND OPERATING INSTRUCTIONS

SHAKTI PUMPING LIFE

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⚠ Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

1. GENERAL DESCRIPTION

1.1 Applications

The SH, SHI, SHN range of Shakti horizontal multistage centrifugal pumps are designed for the pumping of water and other thin, non-aggressive and non-explosive liquids, not containing solid particles or fibres.

1.2 Technical data

Head H	:	Max. 58 m
Discharge	:	Max. 233 LPM
Flow Q	:	Max. 14 m^3/hr
Liquid Temp.	:	0°C to +90°C
Operating Pressure	:	Max. 10 Bar
Rating	:	0.5 HP to 3 HP

1.3 Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EC relating to machinery.

1.4 Operating conditions

1.4.1 Liquid temperature : 0°C to +90°C.

1.4.2 Ambient temperature : Up to +55°C.

1.4.3 Maximum operating pressure :

0°C to +40°C: Up to 10 Bar

+41°C to +90°C: Up to 6 Bar, etc.

1.4.4 Maximum inlet pressure

The actual inlet pressure plus the pressure when the pump is operating against a closed valve should always be lower than the "maximum operating pressure".

1.4.5 Minimum inlet pressure

The table below applies to the maximum flow rates of the pumps and a barometric pressure of 760 mm Hg.

The values stated are the minimum inlet pressures/ maximum suction lifts "H" [m head] at the pump suction port. The values are stated at different liquid temperatures. The head loss in the suction pipe should therefore be taken into account.

The maximum suction lift may be limited by the actual head.

Type	H [m head]			
50 Hz	20°C	40°C	55°C	90°C
SH 2	*4.1	*3.6	*2.7	2.8
SHI 2	*4.1	*3.6	*2.7	2.8
SHN 2	*4.1	*3.6	*2.7	2.8
SH 4	*7.5	*7.0	*6.1	*0.6
SHI 4	*7.5	*7.0	*6.1	*0.6
SHN 4	*7.5	*7.0	*6.1	*0.6
SH 8	*6.3	*5.8	*4.9	0.6
SHI 8	*6.3	*5.8	*4.9	0.6
SHN 8	*6.3	*5.8	*4.9	0.6
SH 12	*5.6	*5.1	*4.2	1.3
SHI 12	*5.6	*5.1	*4.2	1.3
SHN 12	*5.6	*5.1	*4.2	1.3

"H" = minimum inlet pressure during operation.

"H" marked * = maximum suction lift during operation.

1 m head ≈ 0.1 bar.

2. INSTALLATION

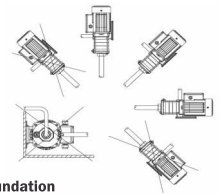
2.1 Pump location

The pump should be installed so that the suction pipe is as short and the suction lift as small as possible.

The pump should be sited in a well ventilated but frost-free position, see section 5.1 Frost protection. It may be sited outside, but it should be protected from the elements by means of a suitable cover.

The pump may be installed in one of the positions shown in fig. 1.

Fig. 1



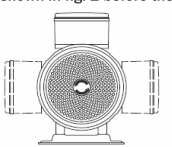
2.2 Foundation

1. the booster doesn't require a special foundation, but it should be positioned on a plane and solid surface (e.g. concrete floor).
2. provide shelter for the pump.

2.3 Position of terminal box

The terminal box can be turned to any one of the positions shown in fig. 2 before the pump is installed.

Fig. 2



To change the position of the terminal box:

1. Remove the four screws which, from the motor side, are screwed into the discharge chamber.
2. Turn the stator housing to the required position.
3. Replace the screws and tighten securely.

2.4 Pipework

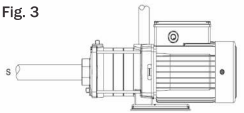
The pipes should be fitted so that any tension caused by variations in temperature does not affect the pump.

2.4.1 Suction pipe

If the pump is to draw liquid from a level lower than the pump suction port, a foot/non-return valve must be fitted to the end of the suction pipe, below the lowest liquid level, since the pump is not self-priming.

The suction pipe is connected to the pump suction port S, fig. 3.

Fig. 3



When the suction pipe is longer than 10 meters or the suction lift is greater than 4 meters, the diameter of the suction pipe must be larger than that of the pump suction port.

Every joint of the suction pipe must be completely tight. If a hose is used as suction pipe, it must be non-collapsible. A strainer is recommended in cases where solids could enter the suction pipe and block the pump.

2.4.2 Discharge pipe

The discharge pipe is connected to the discharge port T, fig. 3.

The discharge pipe should be at least the same diameter as the discharge port of the pump, to mini¬mize pressure drop, high flow velocities and noise.

2.4.3 Bypass

If there is any danger of the pump running against a closed discharge valve, a minimum liquid flow through the pump should be ensured by connecting a bypass/a drain to the discharge pipe. The drain can for instance be connected to a tank.

A minimum flow rate equal to 10% of the flow rate at maximum efficiency is needed at all times. Flow rate and head at maximum efficiency are stated on the pump nameplate.

2.5 Installation examples

The pump is suitable for a wide range of applications. Some examples are shown on page 6.

3. BASIC GUIDELINES FOR BEST PERFORMANCE

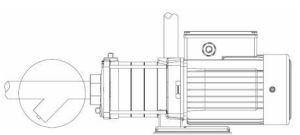
3.1 Installation - Sump

1. Fix foot valve when pump is installed for the sump.
2. Ensure to have a generator back-up in case of power failure.
3. Provide water level controller to avoid running the pump without water (Dry running).
4. Maximum suction lift is 7 mtrs.

3.2 Installation - Overhead Tank

1. Fix Y - Strainer in the suction pipe to filter impurities getting into pump. Clean the strainer at regular intervals (once in month) fig. 4.
2. Provide the water level controller to avoid running the pump without water (Dry running).

Fig. 4



.3 Installation - Solar System

1. All pipes and solar system should be pressure co-mpatable to the pump.

3.4 Installation - Geyser

1. All pipes and Geyser should be pressure compatible to pump.
2. Hose pipe for Geyser should be pressure compatible to pump.

3.5 Installation - By-pass Line

1. Provide by-pass line with non-return valve (NRV) for continuos water supply even during power failure.

4. ELECTRICAL CONNECTIONS

The electrical connections should be carried out in accordance with local regulations. The operating voltage and frequency are marked on the nameplate. Please make sure that the motor is suitable for the electricity supply on which it will be used.

Never make any connections in the pump terminal box unless the electricity supply has been switched off. The pump must be connected to an external mains switch.

Single-phase motors, 1 x 110/220 V, 60 Hz, do not incorporate motor protection and must be connected to an approved motor starter.

Other single-phase motors incorporate a thermal overload switch and require no additional motor protection.

Three - phase motors must be connected to a motor starter, the set nominal current of which must correspond to the electrical data on the pump nameplate. Do not start the pump until it has been filled with liquid.

Connections should be made as shown on the inside of the terminal box cover.

Choose one of the two cable entries and knock out the pre-cut disk.

4.1 Checking of direction of rotation

(Three-phase motors)

Arrows on the motor fan cover indicate the correct direction of rotation.

The pump should rotate counter-clockwise when viewed from the motor end.

To reverse the direction of rotation, switch off the electricity supply and interchange any two of the incoming supply wires.

5. STARTING

5.1 Priming

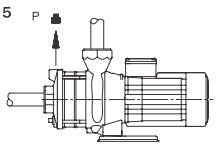
Do not start the pump until it has been filled with liquid and vented.

In systems with hot liquids, extreme caution should be exercised when venting the pump to eliminate the risk of personal injury caused by escaping water.

Booster systems and systems where the liquid level on the suction side is above the pump inlet:

1. Close the isolating valves either side of the pump.
2. Remove the priming plug P, fig. 5.
3. Slowly open the suction valve and keep it open until a steady stream of liquid runs out the priming port.
4. Close the valve, replace the priming plug and tighten securely.
5. Open the suction valve.
6. Start the pump and slowly open the discharge valve until it is fully open.

Fig. 5



Pumping from tanks and wells where the liquid level on the suction side is below the pump inlet:

1. Close the discharge isolating valve.
2. Remove the priming plug P, fig. 5.
3. Pour water through the priming port. Make sure that the suction pipe and pump are completely filled with liquid and vented.
4. Replace the priming plug and tighten securely.
5. Start the pump and slowly open the discharge valve until it is fully open.

5.2 Frequency of starts and stops

Maximum 100 starts per hour.

6. OPERATION AND MAINTENANCE

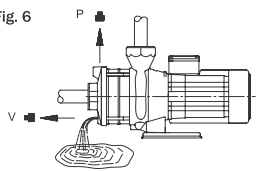
Under normal operating conditions, the pump does not require any maintenance. If the pump has been used for pumping liquids that may leave impurities in the pump, it should be flushed through with clean water immediately after use.

6.1 Frost protection

Pumps which are not being used during periods of frost should be drained to avoid damage.

Remove the priming and drain plugs P and V, fig. 6. Do not replace the plugs until the pump is to be used again.

Fig. 6



7. FAULT FINDING CHART

Before attempting to diagnose any fault, make sure that the electricity supply has been switched off.

Fault	Cause
1. Pump does not start.	a) Supply failure. b) Control circuit has cut out or is defective. c) Motor is defective. d) Pump is blocked by impurities.
2. Pump runs but gives no water.	a) Pump is not filled with liquid. b) Suction or discharge pipe is blocked by impurities. c) Pump is blocked by impurities. d) Suction lift is too great. e) Leakage in suction pipe. f) Foot or non-return valve is blocked.
3. Pump runs at reduced capacity.	a) Wrong direction of rotation (three-phase). b) Suction lift is too great. c) Suction or discharge pipe is blocked. d) Pump is blocked by impurities. e) Foot or non-return valve is partly blocked.
4. Pump stops during operation.	a) Thermal overload switch in motor or external motor protection cuts out. b) Control circuit has cut out.

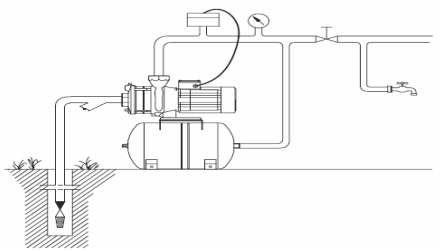
8. DISPOSAL

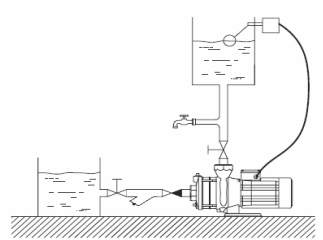
Disposal of this product or parts of it must be carried out according to the following guidelines:

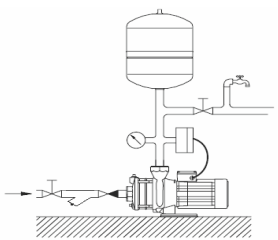
1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Shakti service workshop.

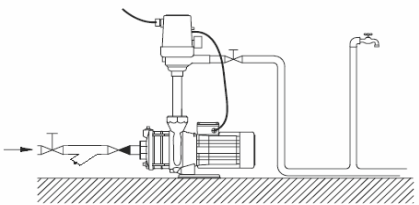
INSTALLATION AND OPERATING INSTRUCTIONS

9. INSTALLATION EXAMPLES









WARRANTY CERTIFICATE

Dear Customer.

Congratulation, for purchasing our product
Shakti Pump and Motor are warranted against defects in workmanship and material under normal use, service and specific duty conditions. We provide one time warranty service for twelve months from the date of purchase by the first user.
Shakti pumps (India) Ltd warrants this product to be free from damage / defects in material and workmanship under normal use and service for twelve month from the date of purchase by the first user.
The user shall produce valid and original copy of invoice for availing warranty. In this warranty period, the product and its parts must be brought and taken at the nearest service center by the customer on to his own expenses.
The warranty does not cover any loss or damage / defect of any nature resulting from wrong product selection / improper installation or install by unauthorized / untrained person / sandy condition / dry running and improper use of the pump set.
The warranty also does not cover consequential losses / transportation damage / damage arising due to failure of pump / motor.
No warranty will be provided on Mechanical seal rubber parts, fasteners, cables in Pump, Motor/ pump set Our obligation is limited to recycling or repairing or replacing product / ex-factory. Equipment for repairs should be returned free of cost to us.
The forgoing is subject to the provision that the user does not open the unit and make any change or repair without prior approval of authorized service center during the warranty period. This warranty excludes every condition whether statutory or otherwise, whatsoever not herein expressly set out

For any dispute Indore (M.P.) jurisdiction will be applicable.

Customer name: .....Customer's phone: .....

Customer Address.....

Invoice No.....Invoice Date .....Model Name: .....

No. of Stage: .....Model Serial No. .....Motor H.P.....

Dealer Name: .....Dealer Ph. : .....

Dealer Address.....

INSTALLATION AND OPERATING INSTRUCTIONS

SHAKTI PUMPING LIFE

INSTALLATION REPORT

Customer's Name: - _____

Customer's Address: - _____

Customer's Ph. No.: _____

Dealer's Name: - _____

Dealer's Address: _____

Dealer's Ph. No. _____

Pump Model:- _____ S.L.No: _____

Project/Application: _____

Pressure In Kg:- _____ Flow in m^3/hr: _____

Liquid:- _____ Temp.: _____

Voltage:- _____ Current: _____

Packing Condition:- _____

Remarks: _____

_____

_____

Date:- _____ _____

Customer's Signature

BOOK-POST

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Stamp