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SHAKTI
PUMPING LIFE

INSTALLATION & OPERATING INSTRUCTIONS



SUBMERSIBLE PUMPS

QF SERIES

CE

SHAKTI
PUMPING LIFE

EC DECLARATION OF CONFORMITY

IN ACCORDANCE WITH EC MACHINERY DIRECTIVES UNDER SELF DECLARATION

Product Designation : Submersible Pumps for 4", 6", 8", 10" & 12" Bore Diameter

Model Reference : 4" Pumps (QF1, QF1.5, QF2, QF5, QF6, QF12, QF20 & QF25)
6" Pumps (QF8, QF10, QF15, QF30, QF50, QF75 & QF100)
8" Pumps (QF125, QF150, QF160)
10" Pumps (QF210, QF270)
12" Pumps (QF360)

Intended End Use : For Submersible Pumps 4", 6", 8", 10" & 12" to be used for Clean water lifting application.

Conforming to the requirement of the following European Directive :

a) EC Machinery Directive - 2006/42/EC

Applicable harmonised standards used :

EN 12100-2010; EN 809:1998+A1:2009

We hereby declare that Submersible Pumps 4", 6", 8", 10" & 12" is intended to be incorporated into OR assembled with other machinery to constitute relevant machinery to comply with the Essential Health and Safety requirement of the above-mentioned directives.

This machinery, its components and sub-assemblies shall not be put in to 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 guidelines are detailed in the instruction manual.

- Date of Manufacturer & First CE marking : 10-Dec-2007
- Date of Review : 22-Oct-2013
- Place of Manufacturer : Shakti Pumps India Ltd, Pithampur.

Issued at : SHAKTI PUMPS (I) LTD.
Pithampur

Marking : CE

The above Submersible pumps must not be put into service/usage for other than specified in the instruction Manual on Date : 10-Dec-2007.

Deo Kumar Thakur
(Manager-QA)

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Before starting installation procedures, must read installation and operating instructions given in the manual carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

SYMBOLS USED IN THIS DOCUMENT

WARNING

Before installation read this installation and operating manual carefully. This manual explains right method of installation.

Caution If these safety instructions are not followed, it may result in malfunctioning or damage of the equipment.

Note Notes or instructions that make the job easier and ensure safe operation.

These instructions are applicable only for Shakti submersible pump sets, types “3”, “4”, “6”, “8”, “10”. If the pump is fitted with another motor than Shakti, please note that the motor data may differ from the data stated in these instructions.

1. GENERAL DATA

1.1 APPLICATION

- Shakti submersible pump sets are used for Drinking Water, Irrigation and other Industrial application. Wherever there is a need to install pump set under water.
- Pump sets are used at Boring, Ponds, River, Canal, and Wall Etc.
- Pump set could be used in Horizontal and Vertical, position.

1.2 PUMPED LIQUIDS

- The fluid used in pump set should be Clean, thin, non-explosive liquids without solid particles or fibers.
- The maximum sand content of the water must not exceed 50g/m³.
- A larger sand content will reduce the life of the pump and increase the risk of blocking.

2. DELIVERY AND STORAGE

2.1 DELIVERY

Shakti submersible pump set are supplied from the factory in proper packing in which they should remain until they are to be installed.

During unpacking and prior to installation, care must be taken when handling the pump to ensure that misalignment does not occur due to bending.

The pump should not be exposed to unnecessary impact and shocks.

When the pump part and motor are supplied as separate units (long pumps), fit the motor to the pump as described in section 5.1 Fitting the motor to the pump.

2.2 STORAGE AND HANDLING

Storage temperature

For Pump – 20 °C to +60 °C.

For Motor – 15 °C to +60 °C.

The pump and motors must be stored in a dry and closed place.

Make sure that the pump cannot roll or fall over. During storage, the pump should be supported.

If the pump has been unpacked, it should be stored horizontally, sufficiently supported, or vertically to prevent misalignment of the pump. (as shown in fig. 1).

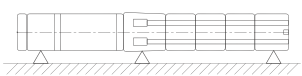


Fig. 1

If it is difficult to lift the pump vertically then hold the pump from motor end as well as pump ends. Take care of the balance as per the length of the pump (as shown in figure 2).

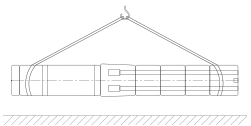


Fig. 2

2.3 SOUND PRESSURE LEVEL

The sound pressure level has been measured in accordance with the rules laid down in the EC machinery directive 2006/42/EC.

Sound pressure level of pumps:

Applies to pumps submerged in water, without external regulating valve.

QF	LpA [dB(A)]
Qf1	<70
QF2	<70
QF5	<70
QF6	<70
QF8	<70
QF 10	<70
QF12	<70
QF15	<70
QF20	<70
QF25	<70
QF30	<70
QF40	<70
QF50	<70
QF75	<70
QF100	<70
QF101	<70
QF105	<70
QF110	<70
QF115	<70
QF125	<70
QF150	<70
QF160	<70
QF210	<79
QF270	<79
QF360	<82

Sound pressure level of motors _ The sound pressure level of Shakti motors is lower than 70 [dB(A)].

3. PREPARATION

WARNING

Before starting the pump, make sure that the electricity supply has been switched off so that it cannot be accidentally switched on.

3.1 CHECK LIQUID INSIDE THE MOTOR

The company fills a special fluid inside the Shakti Submersible Motor. Therefore there is no need to pour water or any other kind of fluid inside.

If Motor is kept unused for more than a year then kindly check the fluid level before installation.

While coupling Motor Pump, make sure that lock Washer is kept below nut. Not between center of the pump and motor.

After coupling the motor join the cable and place the cable guard.

Note There is no need to fill liquid in RO Motor. Motor is already filled with special oil. The level of the liquid in the motor must be checked and the motor must be refilled, if required.

Measure the actual diaphragm distance to the side of the opening in the diaphragm cover by a rod. If the measured result is not identical to the target, value than top up or drain motor fluid. (See Fig. 3)

Note Take care not to damage the diaphragm.

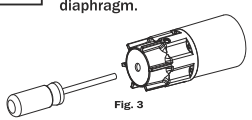


Fig. 3

The following table shows the correct distance from the outside of the bottom plate to the diaphragm.

MOTOR	DISTANCE
6"/8" Motor MATA SF 150/C200	44 mm ±2 mm
6" Motor SML	59 mm ±2 mm
10" Motor MATA SF C10	64 mm ±2 mm

3.2 MAINTENANCE

If Shakti Submersible Pump is kept unused for long then rotate the shaft before use. If Motor is kept unused for more than a year then check the Mager Value by Mager meter. The results should be as per the table below.

New Motor without drop cable	> 200 MΩ
Used Motor without drop cable	> 20 MΩ
New Motor with drop cable	> 2 MΩ
Used Motor with drop cable	> 0.5 MΩ

3.3 POSITIONAL REQUIREMENTS

If the pump is to be installed in a position where it is accessible, the coupling must be suitably isolated from human touch.

Depending on motor type, the Shakti pump can be installed either vertically or horizontally. A complete list of motor types suitable for horizontal installation.

If the pump is installed horizontally, the discharge port should never fall below the horizontal plane, see fig 4.

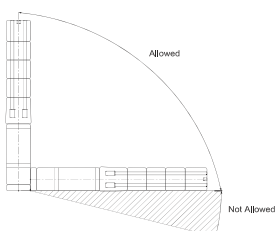


Fig. 4

If the pump is installed horizontally, e.g. in a tank, it is recommended to fit it in a flow sleeve.

3.4 LIQUID TEMPERATURES/COOLING

The maximum liquid temperature and the minimum liquid velocity past the motor appear from the following table.

MOTOR	INSTALLATION		
	FLOW PAST THE MOTOR	VERTICAL	HORIZONTAL
Shakti 4"	0.08 m/s	30 °C (-85 °F)	30 °C (-85 °F)
Shakti 6"	0.2 m/s	30 °C (-85 °F)	30 °C (-85 °F)

It is recommended to install the motor above the well screen in order to achieve proper motor cooling.

Note In cases where the stated liquid velocity cannot be achieved, a flow sleeve must be installed. If there is a risk of sediment deposition, such as sand, around the motor, a flow sleeve should be used in order to ensure proper cooling of the motor.

3.4.1 Maximum Liquid Temperature

Out of consideration for the rubber parts in pump and motor, the liquid temperature must not exceed 40 °C (~105 °F).

The pump can operate at liquid temperatures between 40 °C and 60 °C (~105 °F and 140 °F) provided that all rubber parts are replaced every third year.

4. ELECTRICAL CONNECTION

WARNING

Before starting the pump, make sure that the electricity supply has been switched off so that it cannot be accidentally switched on.

4.1 GENERAL

The electrical connection should be carried out by an authorized electrician in accordance with local regulations.

The supply voltage, rated maximum current and cosø appear from the loose data plate that must be fitted close to the installation site.

The required voltage quality for Shakti submersible motors, measured at the motor terminals, is

–10%/+6% of the nominal voltage during continuous operation (including variation in the supply voltage and losses in cables).

WARNING

The pump must be earthen. The pump must be connected to an external mains switch with a minimum contact gap of 3mm in all poles.

In order that the Shakti motors with a built-in and operational temperature transmitter can meet the EC EMC directive (2004/108/EC), a 0.47 µF capacitor (in accordance with IEC 384-14) must always be connected over the two phases to which the temperature transmitter is connected. See fig. 5

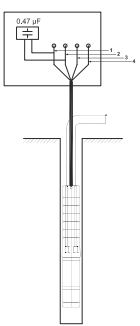


Fig. 5

INDIA 50 Hz		
LEAD	COLOURS	CONNECTION
1 = L1	Red	Phase
2 = L2	Yellow	Capacitor
3 = L3	Blue	Neutral

USA 60 Hz		
LEAD	COLOURS	CONNECTION
1 = L1	Black	Phase
2 = L2	Red	Capacitor
3 = L3	Yellow	Neutral
4 = L4	Green	Earthing

EUROPE 50/60 Hz		
LEAD	COLOURS	CONNECTION
1 = L1	Grey	Phase
2 = L2	Brown	Capacitor
3 = L3	Black	Neutral
4 = L4	Green	Earthing

The motors are wound for direct-on-line starting or star-delta starting and the starting current is between 4 and 6 times the full load current of the motor.

The run-up time of the pump is only about 0.1 second. Direct-on-line starting is therefore normally approved by the electricity supply authorities.

4.2 MOTOR PROTECTION

4.2.1 Single-phase Motors

Single-phase submersible motors type 4" must be protected by a protective device which can either be incorporated in a control box or separate.

4.2.2 Three-phase Motors

Shakti Motors have no built in temperature transmitter.

A PT-100 sensor is available as an accessory.

Motors with PT-100 sensor must be protected by means of:

Motor starter with relay or Connector(s)

Note If this requirement is not meet, the motor warranty will be invalidated.

4.2.3 Required Motor Starter Settings

For cold motors, the tripping time for the motor starter must be less than 10 seconds at 5 times the rated maximum current of the motor.

In order to ensure the optimum protection of the submersible motor, the starter overload unit should be set in accordance with the following guidelines:

1. Set the starter overload to the rated maximum current of the motor.
2. Start the pump and let it run for half an hour at normal performance.
3. Slowly grade down the scale indicator until the motor trip point is reached.
4. Increase the overload setting by 5 %.

The highest permissible setting is the rated maximum current of the motor.

For motors wound for star-delta starting, the starter overload unit should be set as above, but the maximum setting should be as follows:

Starter overload setting = Rated maximum current x 0.58.

The highest permissible start-up time for star-delta starting or auto transformer starting is 2 seconds.

4.3 LIGHTENING PROTECTION

The installation can be fitted with a special over voltage protective device to protect the motor from voltage surges in the electricity supply lines when lightning strikes somewhere in the area, see fig 6.

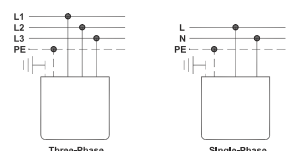


Fig. 6

The overvoltage protective device will not, however, protect the motor against a direct stroke of lightning. The overvoltage protective device should be connected to the installation as close as possible to the motor and always in accordance with local regulations.

4.4 CABLE SIZING

Make sure that the submersible drop cable can withstand permanent submersion in the actual liquid and at the actual temperature.

Shakti can supply submersible drop cables for a wide range of installations.

The cross-section (q) of the cable should meet the following requirements:

1. The submersible drop cable should be sized to the rated maximum current (I) of the motor.
2. The cross-section should be sufficient to make a voltage drop over the cable acceptable.

NOMINAL AREA IN SQ. MM	CURRENT RATING AT 40°C (AMP).
1.5	14
2.5	18
4	26
6	31
10	42
16	57
25	72
35	90
50	115

4.5 CONTROL OF SINGLE-PHASE MOTORS

⚠ The single-phase submersible motor with motor protection (separate) which cuts out the motor in case of excessive winding temperatures while the motor is still supplied with voltage. Allow for this, when the motor forms part of a control system.

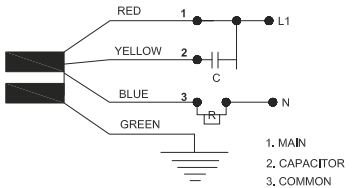
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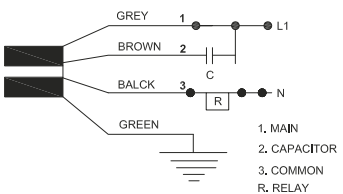
4.6 CONNECTION OF SINGLE-PHASE MOTORS

The SHAKTI motors are connected to the mains via an operating capacitor which should be sized for continuous operation.

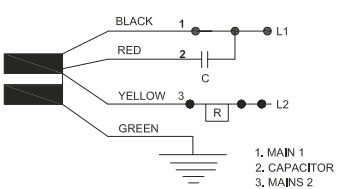
WIRING DIAGRAM FOR INDIA



WIRING DIAGRAM FOR EUROPE



WIRING DIAGRAM FOR USA/KOREA



4.7 CONNECTION OF THREE-PHASE MOTORS

Three-phase submersible motors must be protected. When a conventional motor starter is being used, the electrical connection should be carried out as described below.

4.7.1 Checking Of Direction Of Rotation

When the pump has been connected to the electricity supply, determine the correct direction of rotation as follows:

1. Start the pump and check the quantity of water and head developed.
2. In case of head not developed, stop the pump and interchange two of the phase connections. In the case of motors wound for star-delta starting, exchange lead wire.
3. Again start the pump and check the quantity of water and head developed.
4. Stop the pump.

Compare the results taken under points 1. and 3. The connection which gives the larger quantity of water and the higher head is the correct connection.

4.7.2 Shakti Motors, Direct-on-line Starting

The connection of Shakti submersible motors wound for direction line starting appears from the table below and fig. 9.

LEAD	CABLE/CONNECTION
	SHAKTI 6" MOTORS
L1	U (Brown)
L2	W (Black)
L3	V (Grey)
PE	PE (Yellow/Green)

Check the direction of rotation as described in section 4.7.1

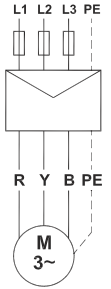


Fig. 9

4.7.3 Shakti Motors, Star-delta Starting

The connection of Shakti submersible motors wound for star delta starting appears from the table below and fig. 10.

Check the direction of rotation as described in section 4.7.1 Checking of direction of rotation.

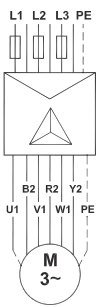


Fig. 10

SHAKTI PUMPING LIFE

4.7.4 Connection In Case Of Unidentified Cable Marking/connection

If it is unknown where the individual leads are to be connected to the mains in order to ensure the correct direction of rotation, proceed as follows:

Motors wound for direct-on-line starting:

Connect the pump to the mains as is expected to be right. Then check the direction of rotation as described in section 4.7.1 Checking of direction of rotation.

Motors wound for star-delta starting:

The windings of the motor are determined by means of an ohmmeter, and the lead sets for the individual windings are named accordingly. See fig. 11.

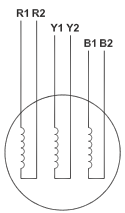


Fig. 11

If star-delta starting is required, the leads should be connected as shown in fig. 10.

If direct-on-line starting is required, the leads should be connected as shown in fig.9.

Then check the direction of rotation as described in section 4.7.1

4.7.5 SOFT STARTER

Shakti only recommends the use of soft starters which control the voltage on all three phases and which are provided with a bypass switch.

R_{amp} times: Maximum 3 seconds.

For further details, please contact your soft starter supplier or Shakti.

5. PUMP INSTALLATION

WARNING
Before starting any work on the pump/motor, make sure that the electricity supply has been switched off so that it cannot be accidentally switched on.

5.1 ASSEMBLY OF MOTOR AND PUMP

HOW TO COUPLE MOTOR WITH PUMP

STEP - 1

REMOVE THE SHAFT PROTECTOR, NUT & WASHER (REF FIG - A) Surfaces of parts to be connected are free from dust & dirt.

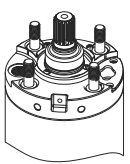


FIG - A

STEP - 2

PUMP FITTED ON MOTOR BY ADJUSTING SPLINE. (REF FIG - B) Apply water resistant, acid free grease to the inner part of coupling

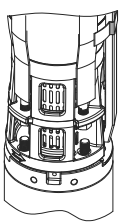


FIG - B

STEP - 3

PLACE SPRING WASHER INSIDE MOTOR STUD (REF FIG - C)

STEP - 4

PUT NUT OVER SPRING WASHER AND TIGHT CROSSWISE AS PER TORQUE STATED BELOW. (REF FIG - D & TABLE NO. 2)

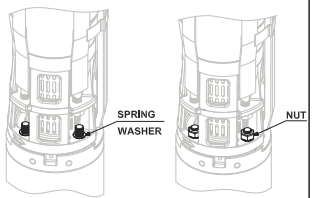


FIG - C FIG - D

The bolts and nuts securing the straps to the pump must be tightened diagonally to the torques stated in the following table no. 1:

STRAPS BOLT/NUT	TORQUE [Nm]
M8	18
M10	35
M12	45
M16	120
QF 360, 50 Hz, with more than 8 stages QF 360, 60 Hz, with more than 5 stages	150

Caution Make sure that the coupling between the pump and motor engages properly.

When Assembling the motor and pump, the nuts must be tightened diagonally to the torques stated in the following table no. 2:

PUMP/MOTOR STAY BOLT SIZE	TORQUE [Nm]
M8	18
M12	150
M16	200
M20	300

Caution Make sure that the pump chambers are aligned when assembly has been completed.

5.2 FITTING OF SUBMERSIBLE DROP CABLE

5.2.1 Shakti Submersible Motors

Before fitting the submersible drop cable to the motor, make sure that the cable socket is clean and dry.

To facilitate the fitting of the cable, lubricate the rubber parts of the cable plug with non-conducting silicone paste.

Tighten the screws holding the cable to the torques stated:

Shakti Motor 4" : 1.5 Nm.
Shakti Motor 6" : 4.0-5.0 Nm.
Shakti Motor 8" : 15.0 Nm.

5.3 RISER PIPE

If a tool, e.g. a chain pipe wrench, is used when the riser pipe is fitted to the pump, the pump must only be gripped by the pump discharge chamber.

The threaded joints on the riser pipe must all be well cut and fit together to ensure that they do not work loose when subjected to torque reaction caused by the starting and stopping of the pump.

The thread on the first section of the riser pipe which is to be screwed into the pump should not be longer than the threads in the pump.

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Note Plastic pipes are recommended for 4" pumps only.

When plastic pipes are used, an unloaded straining wire to be fastened to the discharge chamber of the pump, see fig.14. Should secure the pump

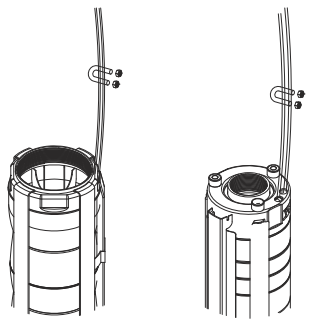


Fig. 14

When connecting plastic pipes, a compression coupling should be used between the pump and the first pipe section.

Where flanged pipes are used, the flanges should be slotted to take the submersible drop cable and a water indicator hose, if fitted.

5.4 MAXIMUM INSTALLATION DEPTH BELOW WATER LEVEL

Shakti Motor 3" : 100 m.
Shakti Motor 4" : 160 m.
Shakti Motor 6" : 350 m.
Shakti Motor 8" : 350 m.
Shakti Motor 10" : 350 m.

5.5 CABLE FITTING

Cable clips must be fitted every 3 meters to fix the submersible drop cable and the straining wire, if fitted, to the riser pipe of the pump.

- Shakti supplies cable clip sets on request. The set consists of a 1.5 mm thick rubber band and 16 buttons.
- Cable fitting: Cut off the rubber band so that the piece with no slit becomes as long as possible.
- Insert a button in the first slit.
- Position the wire alongside the submersible drop cable, fig. 15.



Fig. 15

- Wind the band once around the wire and the cable.
- Then wind it tightly at least twice around the pipe, wire and the cable.
- Push the slit over the button and then cut off the band.
- Where large cable cross-sections are used, it will be necessary to wind the band several times.
- Where plastic pipes are used, some slackness must be left between each cable clip as plastic pipes expand when loaded.
- When flanged pipes are used, the cable clips should be fitted above and below each joint.

5.6 LOWERING THE PUMP

It is recommended to check the borehole by means of an inside caliper before lowering the pump to ensure unobstructed passage.

Lower the pump carefully into the borehole, taking care not to damage the motor cable and the submersible drop cable.

Note Do not lower or lift the pump by means of the motor cable.

5.7 INSTALLATION DEPTH

The dynamic water level should always be above the suction interconnector of the pump,

Minimum inlet pressure is indicated in the NPSH curve for the pump.

The minimum safety margin should be 1-metre head.

It is recommended to install the pump so that the motor part is above the well screen in order to ensure optimum cooling, see section 3.4 liquid temperatures/cooling.

When the pump has been installed to the required depth, the installation should be finished by means of a borehole seal.

Slacken the straining wire so that it becomes unloaded and lock it to the borehole seal by means of wire locks.

Note For pumps fitted with plastic pipes, the expansion of the pipes when loaded should be taken into consideration, when deciding on the installation depth of the pump.

6. START-UP AND OPERATION

6.1 START-UP

When the pump has been connected correctly and it is submerged in the liquid to be pumped, it should be started with the discharge valve closed off to approx. 1/3 of its maximum volume of water.

Check the direction of rotation as described in section 4.7.1 Checking of direction of rotation.

If there are impurities in the water, the valve should be opened gradually as the water becomes clearer. The pump should not be stopped until the water is completely clean, as otherwise, the pump parts and the non-return valve may choke up.

As the valve is being opened, the drawdown of the water level should be checked to ensure that the pump always remains submerged.

The dynamic water level should always be above the suction interconnector of the pump, see section 3.3 Positional requirements and fig. 16.

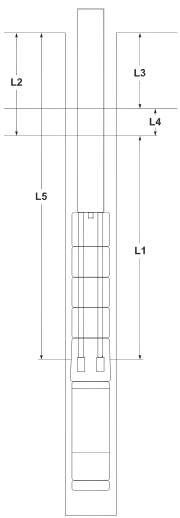


Fig. 16

L1 : Minimum installation depth below dynamic water level.

Minimum 1 meter is recommended.

L2 : Depth to dynamic water level.

L3 : Depth to static water level.

L4 : Drawdown. This is the difference between the dynamic and the static water levels.

L5 : Installation depth.

If the pump can pump more than yielded by the well, it is recommended to fit the Shakti MP 204 motor protector, or some other type of dry-running protection.

If no water level electrodes or level switches are installed, the water level may be drawn down to the suction interconnector of the pump and the pump will then draw in air.

Caution Long time operation with water containing air may damage the pump and cause insufficient cooling of the motor.

7. FAULT FINDING CHART

S. No.	FAULT	CAUSE	REMEDY
1	The pump does not run.	a) The fuses are blown.	Replace the blown fuses. If the new ones blow too, the electric installation and the submersible drop cable should be checked.
		b) The ELCB or the voltage-operated ELCB has tripped out.	Cut in the circuit breaker.
		c) No electricity supply.	Contact the electricity supply authorities.
		d) The motor starter overload has tripped out.	Reset the motor starter overload (automatically or possibly manually). If it trips out again, check the voltage. Is the voltage OK, see items e) - h).
		e) Motor starter/contactor is defective.	Replace the motor starter/contactor.
		f) Starter device is defective.	Repair/replace the starter device.
		g) The control circuit has been interrupted or is defective.	Check the electric installation.
		h) The dry-running protection has cut off the electricity supply to the pump, due to low water level.	Check the water level. If it is OK, check the water level electrodes/level switch.
		I) The pump/submersible drop cable is defective.	Repair/replace the pump/cable.

S. NO.	FAULT	CAUSE	REMEDY
2	The pump runs but gives no water.	a) The discharge valve is closed.	Open the valve.
		b) No water or too low water level in borehole.	See item 3 a).
		c) The non-return valve is stuck in its shut position.	Pull out the pump and clean or replace the valve.
		d) The inlet strainer is choked up.	Pull out the pump and clean the strainer.
		e) The pump is defective.	Repair/replace the pump.
3	The pump runs at reduced capacity.	a) The drawdown is larger than anticipated.	Increase the installation depth of the pump, throttle the pump or replace it by a smaller model to obtain a smaller capacity.
		b) Wrong direction of rotation.	See section 5.7.1 Checking of direction of rotation.
		c) The valves in the discharge pipe are partly closed/blocked.	Check and clean/replace the valves, if necessary.
		d) The discharge pipe is partly choked by impurities (ochre).	Clean/replace the discharge pipe.
		e) The non-return valve of the pump is partly blocked.	Pull out the pump and check/replace the valve.
		f) The pump and the riser pipe are partly choked by impurities (ochre).	Pull out the pump. Check and clean or replace the pump, if necessary. Clean the pipes.
		g) The pump is defective.	Repair/replace the pump.
		h) Leakage in the pipe work.	Check and repair the pipe work.
		I) The riser pipe is defective.	Replace the riser pipe.
4	The pump runs at reduced capacity.	a) The differential of the pressure switch between the start and stop pressures is too small.	Increase the differential. However, the stop pressure must not exceed the operating pressure of the pressure tank, and the start pressure should be high enough to ensure sufficient water supply.

SHAKTI PUMPING LIFE

S. NO.	FAULT	CAUSE	REMEDY
		b) The water level electrodes or level switches in the reservoir have not been installed correctly.	Adjust the intervals of the electrodes/level switches to ensure suitable time between the cutting-in and cutting-out of the pump. See installation and operating instructions for the automatic devices used. If the intervals between stop/start cannot be changed via the automatics, the pump capacity may be reduced by throttling the discharge valve.
		c) The non-return valve is leaking or stuck half-open.	Pull out the pump and clean/replace the non-return valve.
		d) The volume of air in the Pressure/diaphragm tank is too small.	Adjust the volume of air in the pressure/diaphragm tank in accordance with its installation and operating instructions.
		e) The pressure/diaphragm tank is too small.	Increase the capacity of the pressure/diaphragm tank by replacing or supplementing with another tank.
		f) The diaphragm of the diaphragm tank is defective.	Check the diaphragm tank.

Considering continuous product development the information/performance/specifications and illustrations disseminated in this catalogue are subject to change without notice.

WARRANTY CERTIFICATE

Dear Customer,
Congratulation, for purchasing our product.

Pump and Motor are warranted against defects in workmanship and material under normal use, service & specified duty conditions. We provide one time warranty service for twelve months from the date of purchase by the first user.
Shakti Pumps (I) Ltd warrants this product to be free from damage/ defects in material and workmanship under normal use and service for Twelve Months from the date of purchase by the first user. The user shall produce valid and original copy of invoice for availing warranty. The user shall carry defective pump set to nearest authorized service center

This warranty does not cover any loss or damage/ defect of any nature resulting from wrong product selection/ improper installation or installation by unauthorized/ untrained person/ sandy condition/ dry running and improper use of the pump sets.
The warranty also does not cover consequential losses/ damages arising due to failure of pump/ motor.
Our obligation is limited t to recycling or repairing or replacing product/ parts 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.

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

Customer Address: .....

Invoice number: .....Invoice date:.....

Model Name: ..... Model Serial Number:.....

Dealer's Name: .....Dealer's phone:.....

Dealer's Address:.....

APPROVED BY: DATE OF ISSUE

DEVENDRA SULE 17 - 05 - 2016

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

Stamp

To,

Shakti Pumps (India) Ltd.

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