Installation, Operation & Maintenance Manual

BDS Series – Submersible Borehole Stainless Steel Pump

EXCLUSIVE SECURITY STICKERS

All pumps & motors have exclusive designed hologram security sticker with unique serial number certifying that the said products are original and genuine produced by Stellar Pump Australia.

To validate if product purchased is original & genuine, serial numbers are registered in **"Authentic"** page of Stellar Pump official website **http://www.stellarpump.com.au** Serial numbers can be found in metal nameplates & data information stickers.

If your serial numbers are not on the list, it means

- The list is not yet updated. *(quarterly updating the Authentic page)*
- It has been removed to accommodate newly registered serial numbers.
- The product(s) that you have received is counterfeit of unknown origin.

Original and genuine product data information & technical specifications can be provided within 48 hours to 72 hours upon receipt of requested email. Send your request along with serial number, complete name, company, business address, position & contact details to **authenticity@stellarpump.com.au**

On behalf of Stellar Pump Australia and authorized local distributor, we appreciate for doing business with us & we trust that you will enjoy using our genuine high performance & reliable products.

STELLAR PUMP AUSTRALIA

TABLE OF CONTENTS:

SECTION I: INTRODUCTION

STELLAR BDS Series submersible borehole stainless steel pumps are designed for extreme high in head. The said series is made in stainless steel with built-in non return valve. Cost economical, space saving, high quality & wide series of applications in deep wells, thermal well, reservoir, canals & irrigations. It can be used in commercial establishments, industrial sectors, municipal & water districts.

This IOM Manual shall be read entirely prior for installation and operation. Stellar Pump shall not be liable for any injuries, damages & pertaining cost due to failure in observing the instructions and maintenance contained in this manual.

The following symbols indicated in this manual are needed to pay attention:

Extreme hazard which will result of severe injury or death

Hazard which could result of personal injury or severe damage to property

Hazard which could result of minor injury or damage to property

SECTION II. GENERAL PRACTICE

1. Do not operate the pump without proper procedure of priming (pump volute flooded with water).
2. Do not operate the pump if water has sand sediment of more than 50g/m^3
3. Maximum Lifting Speed shall be 3 meters per second.
4. Do not operate the pump beyond its limits and parameters.
5. Always shut down the power supply when performing maintenance checkup in electric motor terminal box.
6. Never operate the pump if power supply (voltages) are not within the normal ranges.
7. Never operate the pump without proper procedure of checking pump alignment. Excessive vibration could result of severe damage of pump and motor.
8. For deep well application, it is required to install necessary electrical components to protect the pump and motor against voltage surge due to lightning.
9. Always wear personal protective equipment before performing installation, operation and maintenance of this pump.

SECTION III. WARRANTY CONDITION

- This warranty applies against all defective materials and/or faulty manufacture for the period of **One (1) year** from the date of shipment unless specifically stated otherwise.
- Pumps shall be used in accordance for only specific purpose and shall be operated within the designed limits & capabilities.
- Valid replacement of parts and components shall be shipped direct to client free of charge. However, labor cost for replacement of parts, disassembly and assembly of pumps is not included.
- This warranty shall be null and void if other parties have tampered, adjusted and/or repaired the pump.
- For genuine spare parts, kindly refer to authorize distributor or agent of Stellar Pump in your local area.

SECTION IV. STORAGE

- Storage room or warehouse should be clean, free from any dust particles that could enter to sensitive rotating parts of the pump & motor.
- Pump shaft should be rotated 15 to 20 revolutions periodically.
- Protect against corrosion by painting corrosive resistant coating of some unpainted surfaces of the pump.

SECTION V. INSTALLATION

1. **Deep well**
    a. The well must be complied with necessary codes.
    b. Quality of water inside the well must be checked, free from any excess mud or sand to avoid overheat of motor and damaging the internal parts of the pump.
    c. Water capacity inside the well should be equal or more than the capacity of pump to avoid dry run operation (operating without water).
    d. Drawdown level must be at least 10ft higher than the pump suction of the pump.

    e. Submersible motor must be cooled at all times. If motor temperature is increasing due to several reasons, flow inducer tube or shroud may be required. Please check IOM manual of submersible motor for details.
    f. Inside well diameter casing must be large enough to install the submersible pump without scratching or denting the pump & motor surface including the submersible drop cables.
    g. It is required to install necessary device or components for protection against dry run operation (operating without water).

2. **Above Ground (Elevated) or Below Ground (Cistern) Water Tank**
    a. Above or below ground water tanks must be complied with necessary codes.
    b. Water tanks must be free from any constructions debris, large solid particles or welding fluxes to avoid damaging the internal parts of the pump.
    c. Submersible pump may be installed in vertical position provided that the water level should not reach the valve casing outlet of the pump to avoid producing water vortex during operation.
    d. Submersible pump may be installed in horizontal position provided that the water level should not reach 5ft from the pump suction. Baffle plate or anti-vortex plate must be installed within pump suction area if distance of 5ft cannot be attained.
    e. It is required to install necessary device or components for protection against dry run operation (operating without water).

3. **Piping Connections**

    a. Procedure of installation of piping connections shall be in accordance to related plumbing and/or water system codes & local regulations.
    b. For deep well, check valve may be installed in vertical column pipe or main riser column pipe for every 100ft to avoid surge back flow and water hammer when operation stops.
    c. Proper support brackets and/or thrust blocks in discharge pipe must be installed.
    d. Valves, fixtures and fittings must be followed in accordance to plumbing and/or water system codes & local regulation with all necessary mechanical valves to protect the pump and piping system during operation.

4. Wiring Connections for Submersible Electric Motors

a. Procedure of installation of submersible wires and cables for submersible electric motor shall be in accordance to related electrical code & local regulations.
b. Submersible wire or cable sizes must be appropriate to Kilowatt (kw) or Horsepower (hp) rating of electric motor including voltage drop. Kindly refer to electrical code & local regulations.
c. Procedure of submersible wire or cable termination or connection should be followed in accordance to electric code & local regulations. Please check IOM manual of submersible motor for details.
d. Electrical components related in protecting the electric motor against irregular conditions should be installed in control panels.

SECTION VI. OPERATION PROCEDURE

1. Pre-start-up & Checking

a. Wear Personal Protective Gear or Equipment prior for start-up and operation.
b. Prepare your instrument or tools to observe the performance of the pump.
c. Check water source. Never operate the pump if water has presence of excess sand or any solid particles.
d. Check motor insulation using insulation tester. Never activate the motor if insulation reading is less than 100 mega ohms. Please check IOM manual of submersible motor for details.
e. Check power voltage. Never operate motor if voltage is not within the normal range. Please refer Section VII. #5.a for reference.
e. Make sure rotation of electric motor is correct prior for start-up to avoid producing strong vibration during operation.

2. Start-Up

a. Close the isolation valve in discharge pipe.

b. Start the driver.
c. Slowly open the isolation valve in discharge pipe.
d. Do not operate the pump exceeding to its rated working pressure.
e. Use calibrated tester or current meter instrument to check if actual current of motor is within the normal range.
f. Observe the pump & discharge pipe. If excess vibration and disturbing noise are observe, immediately shut down the motor and inspect the pump and main riser column pipe.
f. Adjust all necessary protective electrical components in control panel for motor protection.
g. Do not operate electric motors if actual voltage fluctuates. Please refer Section VII. #5.a for reference.

3. Pump Stop

a. Necessary valves & fittings are required to protect the pump from water hammer effects when stopping the operation. Please refer to plumbing and/or water system codes & local regulations for reference. For deep well, check valve may be installed in vertical column pipe or main riser column pipe for every 100ft to avoid surge back flow and water hammer when operation stops.
b. When the pump stops, avoid activate the pump. An interval of 30 minutes prior for start up again is highly recommended to avoid increase of motor temperature.

SECTION VII. MAINTENANCE PROCEDURE

1. Routine Inspections

a. Check the pump if it is producing disturbing noise and/or vibration. Kindly shut down the pump immediately and inspect the pump and piping system.
b. Check motor insulation using insulation tester.
c. Check current condition while motor is operating. Motor current readings should be within the normal range. Compare the said readings with previous data.
d. Water level in deep well or water tank should be sufficient enough while pump is operation.
e. Check quality of water discharging from the pump. Do not operate if water has presence of excess sand & mud.
f. Shut down the motor if produces unbalance voltage during operation.

2. Electrical Conditions

a. Power voltage fluctuations
    i. To maintain the expected life period, do not operate the electric motor if
        1. Actual voltage fluctuates beyond tolerance bands of +/- 10% from normal power voltage.
        2. Actual voltage fluctuates within tolerance bands of +/- 10% from normal power voltage for more than 60 minutes each day.
    ii. Electric components for protection against abnormal fluctuation of power supply voltage or to maintain the stability of power supply voltage for entire day is required to avoid premature damage of electric motor.
    iii. Check the condition of electrical components inside the control panel. Make sure the electrical components or device for protection against voltage surge is working properly.
b. Submersible Motors
    i. Please check IOM manual of submersible motor for complete details.

SECTION VIII. SPARE PARTS

1. Recommended Spare Parts for BDS Submersible Borehole Stainless Steel Pump

a. Intermittent duty

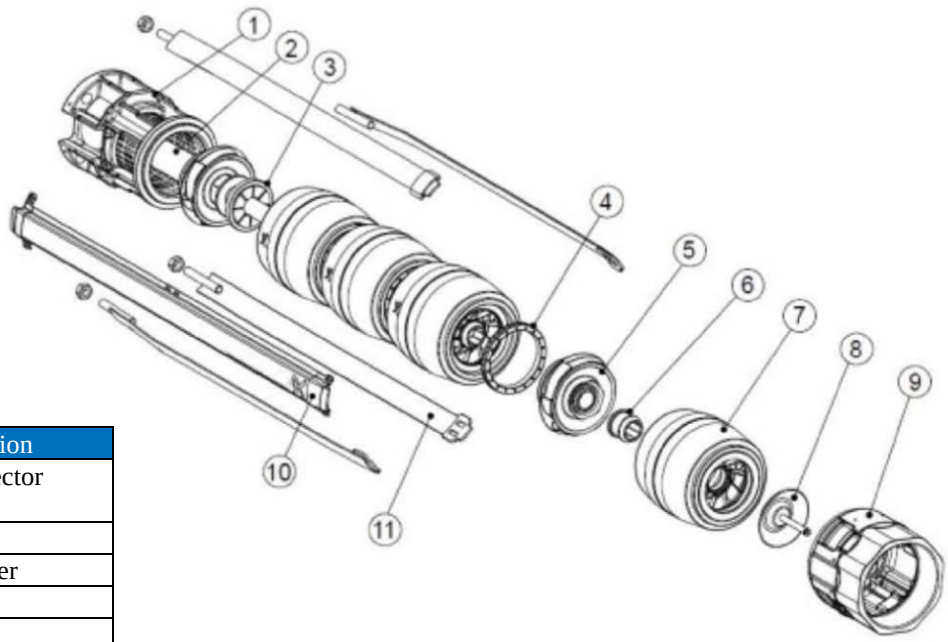
*Item	Description
5	Impeller
11	Strap

* Refer to Section IX for reference

b. Continuous operation

*Item	Description
5	Impeller
11	Strap
7	Diffuser Chamber
8	Valve Cap
6	Bearing
4	Seal ring

SECTION IX. EXPLODED VIEW



Item	Description
1	Suction Connector (Inlet)
2	Pump Shaft
3	Spacing Washer
4	Seal Ring
5	Impeller
6	Bearing
7	Diffuser Chamber
8	Valve Cap
9	Valve Casing (Outlet)
10	Cable Guard
11	Strap

SECTION X. TROUBLE SHOOTING

Problems	Causes	Recommended Solutions
No discharge flow	1. Trap air or leak at main riser column pipe 2. Impeller clogged 3. Damaged shaft and impeller 4. Pump is unplug from main riser column pipe	1. Remove trap air or repair leak. 2. Remove solid particles 3. Replace shaft and impeller 4. Install the pump into main riser pipe properly
Actual pump capacity and/or head insufficient	1. Insufficient NPSH 2. Actual head greater than expected 3. Trap air or leak at main riser column pipe 4. Impeller direction wrong 5. Small Impeller diameter 6. Impeller clogged 7. Wear ring defective	1. Reduce suction lift 2. Throttle the isolation valve or replace bigger pump 3. Remove trap air or repair leak. Prime properly the main riser column pipe 4. Interchanged wires & cables to reverse the rotation 5. Replace impeller but take note BHP vs motor HP 6. Remove solid particles 7. Replace wear ring
Excessive noise and vibration	1. Trap air or leak at main riser column pipe 2. Impeller direction wrong 3. Misalignment	1. Remove trap air or repair leak. Prime properly the main riser column pipe 2. Interchanged wires & cables to reverse the rotation 3. Realign shaft.
High current readings in electric motor	1. Abnormal power voltage 2. Impeller clogged 3. Misalignment 4. Low or no motor Insulation 5. Unbalance voltage or motor current 6. Actual head greater than expected	1. Use electric components to stabilize the power voltage 2. Remove solid particles 3. Realign shaft. 4. Rewind or replace the motor 5. Check power supply voltage 6. Throttle the isolation valve or replace bigger pump
Pump volute produces high temperature	1. Trap air or leak at main riser column pipe 2. Water temperature is above normal	1. Remove trap air or repair leak. Prime properly the main riser column pipe 2. Install flow inducer tube or shroud.