Installation, Operation & Maintenance Manual

DTM Motor Series

Submersible Motor for Deep well 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

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SECTION I: INTRODUCTION

STELLAR DTM Series 4 inches diameter submersible electric motor is designed for submersible borehole deep well stainless-steel pumps. The said series is made in all stainless-steel 304 casing with built-in 3 meters submersible cables. Cost economical, space saving, high motor efficiency & Class F insulation.

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 motor without water (entire motor casing should be flooded with water).
2. Maximum Lifting Speed shall be 3 meters per second.
3. Do not operate the motor beyond its limits and parameters.
4. Always shut down the power supply when performing maintenance checkup in electric motor's submersible cables.
5. Never operate the motor if power supply (voltages) are not within the normal ranges.
6. Never operate the motor without proper procedure of checking alignment & tightness of bolts to submersible borehole pump. Excessive vibration could result of severe damage of pump and motor.
7. 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 motor.
- Motor shaft should be rotated 15 to 20 revolutions periodically.
- Lubricant shall be applied to motor spline shaft & bolt threads to avoid corrosion
- Place the motor inside the storage box if stored for longer period of time.

SECTION V. INSTALLATION

1. **Pump Room or Storage**
    a. Pump room or storage should be clean, free from any construction activities, materials & debris.
    b. Pump room or storage should be ventilated with proper lighting, safety / warning signage & secured with steel door and lock.
    c. Pump room or storage should be provided for provision of crane or chain block for installation & maintenance purposes.
    d. Pump room or storage should be protected against flooding.

2. Mounting

a. Submersible "DTM" Motors are designed for mounting in vertical position.
b. If motors will be installed in horizontal position or with a certain angle of position, motor bearing life period is expected to decrease. Therefore, the recommendations to maximize the motor life expectancy are as follows:
    A. Reduce the number of starts per hour, average of 10 to 15 starts per hour.
    B. Install flow inducer tube to ensure the cooling flow in the motor. See Section V, item 4 for details of flow inducer tube.
c. Submersible cables should be mounted & installed properly with cable guard of submersible borehole pump.
d. Submersible motors should be properly connected with submersible borehole pump where all bolts are tightened evenly.
e. Minimum of Six (6) inches distance from bottom of submersible motor to floor of storage water tank or open body is recommended for maintenance purposes.

3. Alignment

⚠CAUTION

a. Submersible borehole pump suction interconnector should be designed in NEMA standard dimensions.
b. Motor shaft spline must be connected properly and evenly to the submersible borehole pump shaft spline coupling.
c. Bolts should be tightened evenly.
d. Pump & motor shaft should be rotated freely in counterclockwise direction using hand or fingers.

4. Flow Inducer Tube

a. If motor will be installed in open body of water or storage water tank, flow inducer tube is necessary to produce cooling flow of water in submersible motor.
b. Typical construction of flow inducer tube is that the flow of water should pass thru the body of motor to maintain the motor operating temperature.
c. Minimum of 0.1 meter per second for 4 inches diameter motor is required for proper cooling.
d. See figure 1 to figure 2 for recommended construction of flow inducer tube made in SDR35 PVC pipe

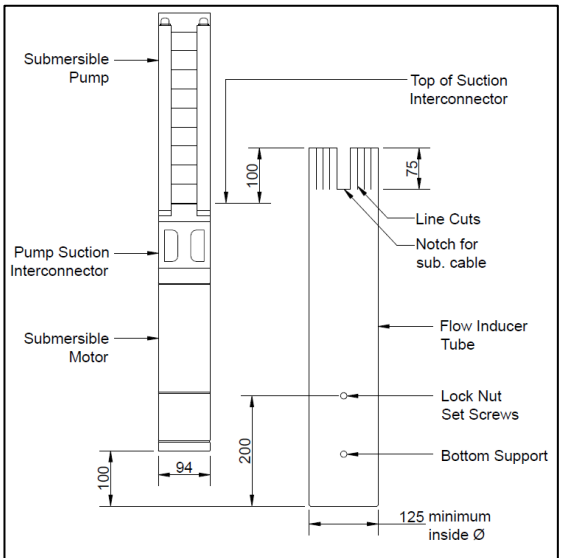

Figure 1: Flow Inducer Tube

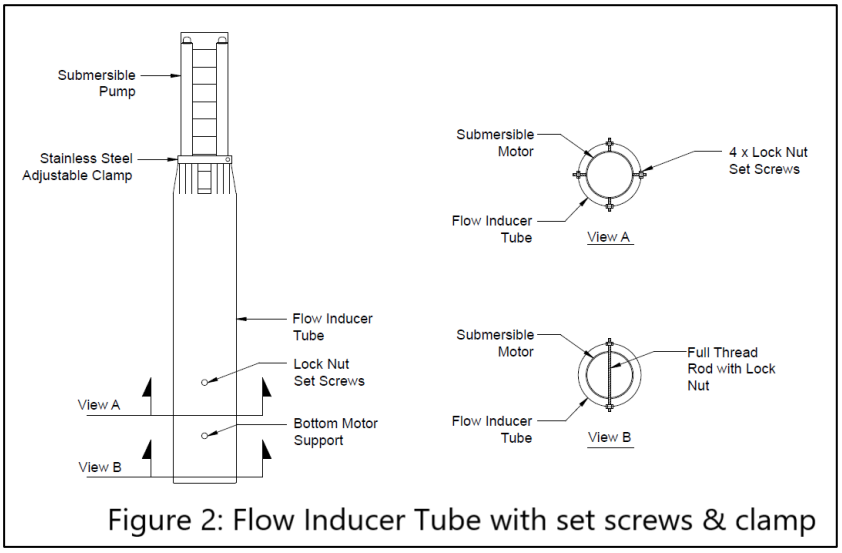

Figure 2: Flow Inducer Tube with set screws & clamp

5. Wiring Connections for Electric Motors

⚠ DANGER

a. Always cover the end of submersible cables with PVC or electrical tape to avoid entry of water or dust during pre-installation.
b. Procedure of installation of submersible cable wires for submersible motor shall be in accordance to related electrical code & local regulations.
c. Wire or cable sizes must be appropriate to Kilowatt (kw) or Horsepower (hp) rating of electric motor. Kindly refer to electrical code & local regulations.
d. Measure the insulation of submersible cables using insulation resistance tester before proceeding in termination. Submersible motor is in good condition if insulation resistance is more than 0.50 megaohms or 500,000 ohms in value.
e. If built-in submersible cables are needed to connect with submersible wires, proper connection must be handled to prevent short circuit condition which it will damage the submersible motor. The recommended procedures in wire connections are as follows
    A. Terminate the two submersible cables using rubber tape and PVC tape. See Figure 3.
    B. Use splicing kits to establish the connections of two submersible cables. Follow the splicing kit instruction manuals.
f. Necessary electrical component devices in submersible pump control panel are required for protection of the motor.
    A. If submersible motors are installed in open field area, surge lightning arrester is necessary for protection against lightning strike in the area.
    B. Thermal overload relays or thermal adjustment breakers are necessary for protection if motor produces high current ratings.
    C. Under & over voltage relays are necessary for protection against voltages that are not within the normal range.
    D. Relay for protection against single phasing is necessary for protection against failure of any terminal lines.

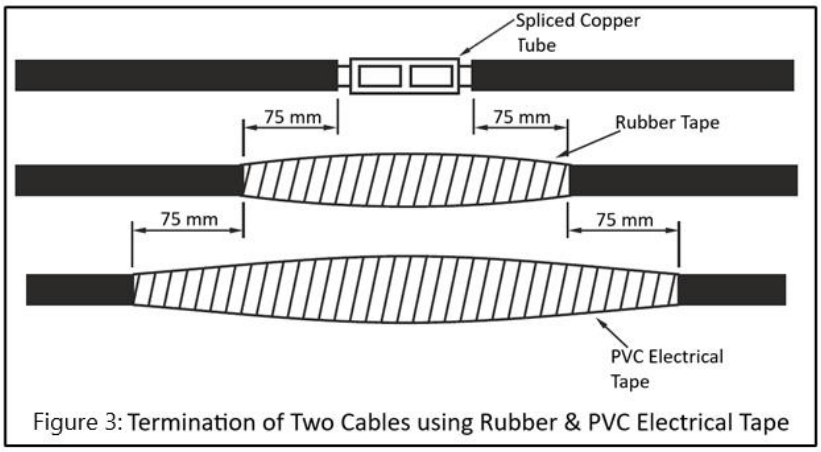

Figure 3: Termination of Two Cables using Rubber & PVC Electrical Tape

SECTION VI. OPERATION PROCEDURE

⚠ DANGER

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 motor.
   c. Check water source. Never operate the motor if water has presence of large sand or any large solid particles.
   d. Never operate the motor if water level is low or empty.
   e. Motor shaft must be rotated freely by hand.
   f. Never operate the motors if voltages are not within the normal ranges and/or imbalance voltage.
   g. Water temperature should be within 2 degrees Celsius to 40 degrees Celsius.
   h. Adjust all necessary electrical component devices in control panel in accordance to the electrical data of installed motor.

2. **Start-Up**
   a. Make sure the rotation of submersible motor is counterclockwise rotation when viewed from the top shaft.

⚠ DANGER

   b. Start the motor.
   c. Slowly open the isolation valve in discharge pipe.
   d. Use calibrated tester or current meter instrument to check if actual current of motor is within the normal range.
   e. If vibration is disturbing during in operation, immediately shut down the operation and inspect the alignment of pipes & pump/motor or motor rotation.
   f. Do not operate the electric motors if actual voltage fluctuates. Please refer Section VII. Item 4, letter 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.
b. If pump will not be used for longer period or if climate of freezing exists, close the discharge isolation valve and drain the water inside the pump volute completely.

SECTION VII. MAINTENANCE PROCEDURE

1. **General Maintenance**
   a. Pump room should be clean & free from any dust particles or any related matters to maintain the smooth operation of pump & motor

   b. Floor of pump room or storage should be dry, free from any stagnant water for avoid certain accidents.
   c. No moisture or humidity exists inside the pump room or storage. Necessary ventilation system is required.
   d. Pump room or storage must be secured, free from any thieves and trespassers. Only authorized personnel or maintenance should have an access inside.

   e. Shut down all power supply when performing maintenance routine to avoid certain accidents.
   f. Wear Personal Protective Gear or Equipment before performing maintenance check.
   g. It is highly recommended to regularly update the maintenance record for future reference.
   h. Check the termination of wires or cables inside the control panels. Retighten the bolts and screw if necessary.

2. **Motor Insulation Resistance**
   a. Periodically measure the motor insulation resistance using insulation resistance tester. Do not operate if motor insulation reaches below 0.50 megaohm or 500,000 ohms in value.

3. **Water Condition**
   a. Water body temperature should maintain below 40 degrees Celsius to prolong the life period of the motor.
   b. Water should be clean, free from any large sand or solid particles.

4. Electrical Conditions

⚠ DANGER

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.

SECTION VIII. MOTOR DATA INFORMATION

1. Laser Technology

a. All motor data information is labeled in motor body using latest laser marker technology.
b. Laser making technology prevents tampering of information, ensuring that the said motors are genuine supplied and accurate in information.
c. Standard format of motor data information is shown below.

NW8M0203

Stellar Pump Australia

Submersible motor						MOTOR 3~	
						CODE	4H1000T A10
						TYPE	DTM7.5
Hz	HP	KW	V	A	COS φ	RPM	IEC 60031-1
60	10	7.5	220	31.4	0.80	3430	CL F IP 68
60	10	7.5	230	30.0	0.79	3440	SF 1.15
60	10	7.5	240	28.7	0.78	3450	W.T 32.4KG

CE

Australia new technology

SECTION IX. TROUBLE SHOOTING

Problems	Causes	Recommended Solutions
Cannot Start	1. No power 2. Wires not terminated 3. Electrical components trips 4. Submersible cables damage & wrap around pump & motor	1. Switch On power supply 2. Connect the wires properly 3. Reset the device & start 4. Replace cables. Retighten the discharge pipe to pump discharge.
Excessive noise and vibration	1. (3 phase) Wrong rotation 2. Misalignment 3. Voltages not within the normal range	1. Interchanged 2 terminal lines to reverse the rotation 2. Motor spline must be seated properly. Bolts in suction connector must be tightened evenly. 3. Do not operate if voltage is abnormal or imbalance.
Motor body produces excessive heat	1. Misalignment 2. Water flow not enough speed 3. Low or no motor insulation	1. Motor spline must be seated properly. Bolts in suction connector must be tightened evenly. 2. Install flow inducer tube 3. Do not operate if motor resistance is below 0.5 megaohms in value. Replace the motor
High motor current readings & temperature	1. Abnormal power voltage 2. Improper wire size 3. Misalignment 4. Low or no motor Insulation 5. Loose connection 6. Submersible cables damage & wrap around pump & motor	1. Use electric components to stabilize the power voltage 2. Install appropriate wire sizes 3. Motor spline must be seated properly. Bolts in suction connector must be tightened evenly. 4. Do not operate if motor resistance is below 0.5 megaohms in value. Replace the motor. 5. Retighten all bolts 6. Replace cables. Retighten the discharge pipe to pump discharge.
Motor running but submersible pump produces no water flow.	1. Low water or empty 2. Motor disconnected to pump 3. Misalignment	1. Do not operate if water level is low or empty 2. Retighten all bolts in pump suction interconnector. 3. Motor spline must be seated properly. Bolts in suction connector must be tightened evenly.