

Seven Inch Borewell Submersible Pump Sets

Instruction &
Operating Manual



**Texmo
Industries**
Est. 1956



Table of Contents

- 1.** Introduction
- 2.** Warranty information
- 3.** Complying with standards
- 4.** Contents in the packing box
- 5.** Information about your pump
- 6.** Schematic drawings
- 7.** Key product specifications & features
- 8.** Cross-section view
- 9.** Pre-installation requirements
- 10.** Installation procedures
- 11.** Basic troubleshooting
- 12.** Preventive maintenance checks
- 13.** Do's and don'ts
- 14.** Important safety instructions
- 15.** Storage & handling
- 16.** Company contact information

1. Introduction

Thank you for choosing a quality product manufactured by Texmo Industries. We request you to read this manual carefully to ensure that the system you have purchased will be operated correctly.

This manual is intended to provide you with information on your product and information on installation and operation. You will also find information on how you could contact Texmo Industries, should you need further information or help and support.

2. Warranty information

Please refer to your warranty card or visit **www.taropumps.com** for more information on your warranty.

3. Complying with standards

IS 694: Polyvinyl Chloride insulated, unsheathed / sheathed cables / cords with rigid and flexible conductor for rated voltages up to and including 450/750 V

IS 3043: Code of Practice for earthing: specifications

IS 8034: Submersible Pumpsets: specifications

IS 9283: Motors for Submersible Pumpsets: specifications

4. Contents of the packing box

Based on the model you have purchased, your Borewell Submersible Pump is packed along with instruction manual and warranty card in either a corrugated box or in a wooden crate.

5. Information about your pump

Taro Borewell Submersible pumpsets are manufactured using high quality raw materials and components and using state-of-the-art manufacturing facilities. Taro Borewell Submersible pumpsets will provide trouble-free performance if properly installed and maintained. Prior to installation, read this manual carefully and follow the instructions for installation and maintenance of our submersible pumpset so as to ensure reliable operation and performance.

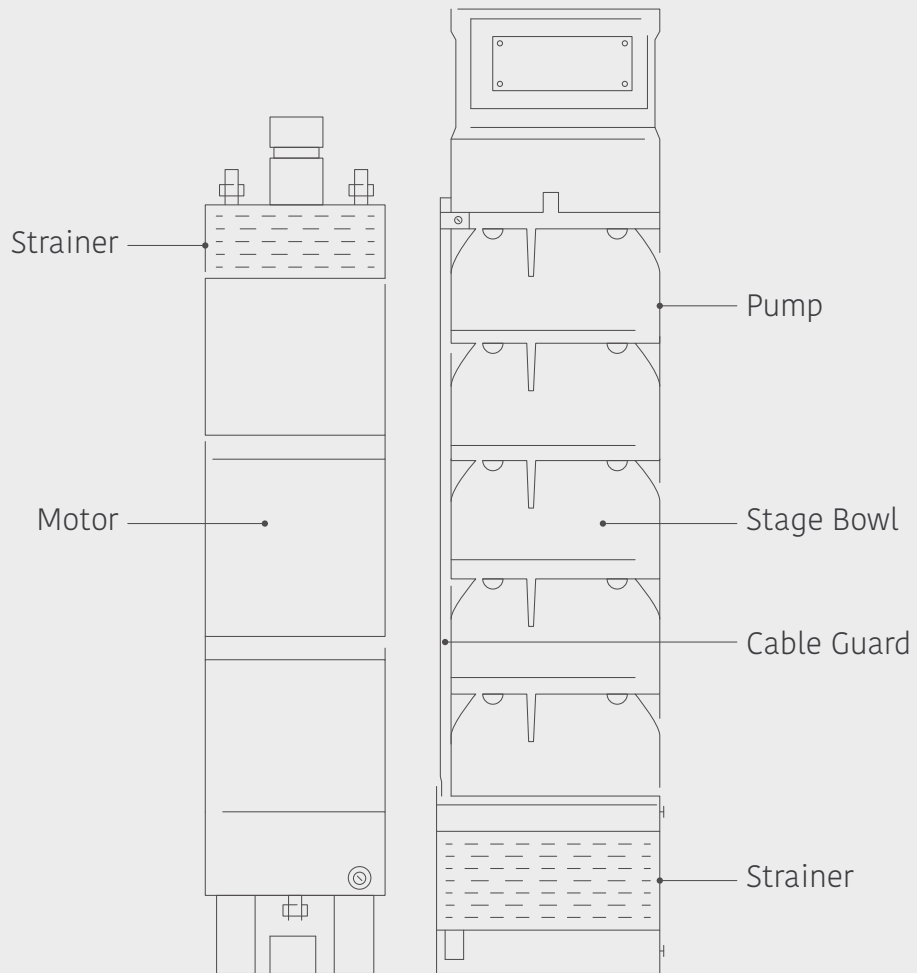
Applications include farm irrigation (Flood / Sprinkler / Drip), domestic and community water supply, water supply to high rise buildings, housing complexes, bungalows, industries, cattle and poultry farms, irrigation of farms, dairies, cooling water circulation systems, firefighting systems and fountains.

The submersible pumpset should be installed by technically qualified personnel in compliance with national and local electrical codes and as per our instructions in order to avoid electrical shocks, unsatisfactory performance, and equipment failure.

6. Schematic drawing

View of a 7 inch Submersible Pump Set is shown below in Fig. 1:

Fig. 1 View of 7 inch Submersible Pump Set



7. Key specifications & features

Standard Specification of 7 inch Borewell Submersible Pumps with 6 inch Submersible Motors is shown below in TABLE 1:

| | |
|------------------------|--|
| Phase and Power | Three phase: 5 - 20 HP |
| Motor Type | Wet |
| Starting method | < 7.5HP: DOL |
| | 7.5HP: DOL and SD Versions available |
| | > 7.5HP: SD |
| Operating Voltage | Premium: 350 - 440 V Power: 300 - 400 V |
| Frequency | 50 Hz |
| Speed | 2850 rpm |
| Duty | S1 Continuous |
| Max. Fluid Temperature | 33°C |
| Impeller Type | Mixed |
| Cable | 3 Core PVC Insulated flat cable |

Product Performance Specification

Texmo Industries has a wide variety of 7 inch Borewell Submersible Pumps coupled to 6-inch Submersible Motors to meet your requirements. Please consult our Sales Team / your nearest dealer to meet your specific requirements.

Key features: Motor

- ✓ Motor is filled with a mixture of pure clean water mixed with anti-corrosive liquid for improved motor life
- ✓ Designed for wide voltage operation
- ✓ The motor houses water-lubricated journal and thrust bearings
- ✓ The stator winding is water cooled and is made from poly-wrapped copper wire
- ✓ Oil seal and sand guard is provided to prevent sand entry
- ✓ High grade carbon thrust bearing enables reliable operation
- ✓ Winding overhang protector provided to ensure coil life
- ✓ LTB-4 bush for longer life for motors rated below 20HP
- ✓ Carbon bushes for longer life in 20 HP
- ✓ Motors fitted with copper rotor
- ✓ Easily re-windable squirrel-cage motor
- ✓ High quality seal rings and sand guard to protect motor from sand entry
- ✓ Equipped with rubber diaphragm to compensate thermal expansion of water

Key features: Pump

- ✓ Smooth surface finish achieved by advanced manufacturing practices resulting friction free flow inside the pump
- ✓ Dynamically balanced impellers for long life
- ✓ Special nitrile rubber bearing bushes for high wear resistance
- ✓ Built-in NRV with low head loss design

- ✓ Pumps fitted with cast steel impellers
- ✓ Bowl cast in CI FG 200 A for better withstanding of sand erosion
- ✓ Stainless steel shafts

Strainer

- ✓ To prevent ingress of pebbles into the intake during pumping, a Stainless Steel strainer is wrapped around the inlet bracket and cable box

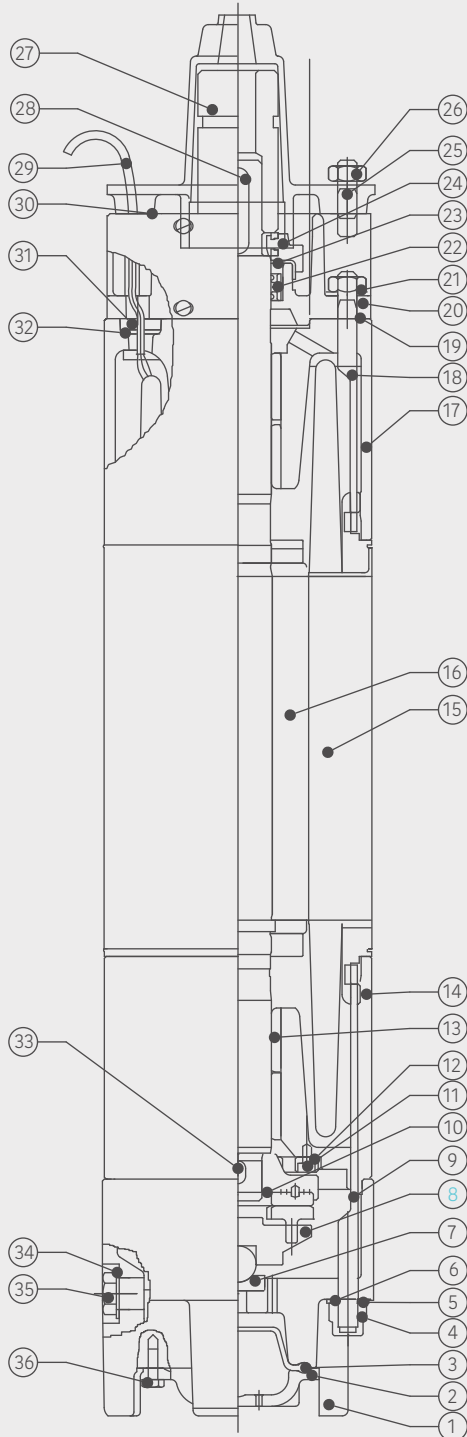
Key features: Wiring Harness

- ✓ All submersible motors are provided with 3-core PVC-insulated flat cable of length 3 metres

8. Cross-section view

Cross-section view of a Three Phase 7 inch Submersible Motor is shown below in Fig. 2:

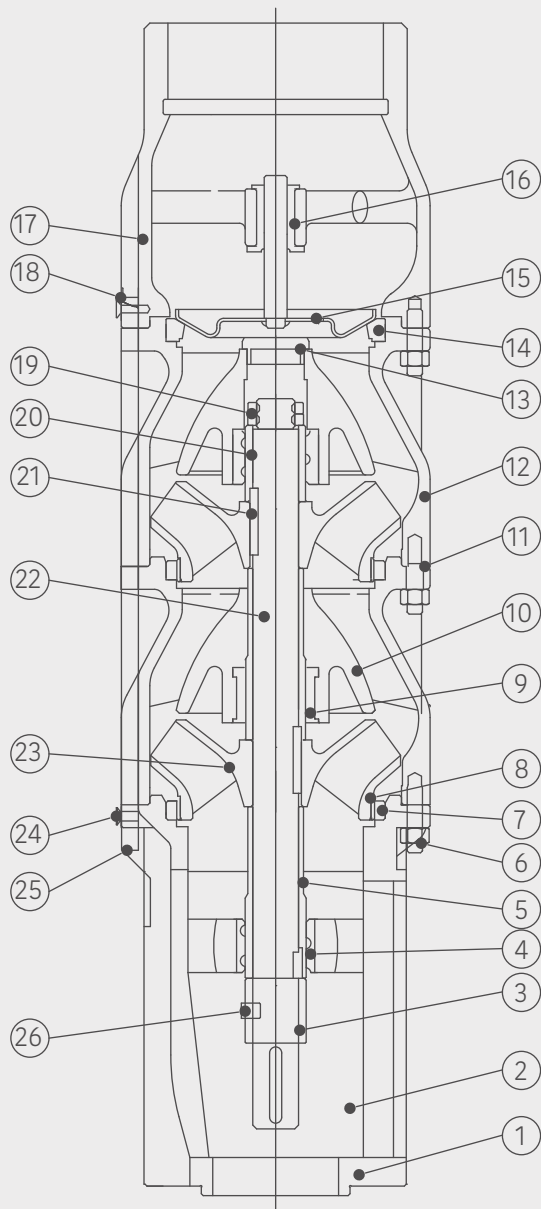
Fig. 2 Cross-section view of 7 inch three-phase submersible motor



| No. | PART NAME |
|-----|-----------------------------|
| 1 | Motor Base |
| 2 | Diaphragm cap |
| 3 | Diaphragm |
| 4 | Cap Nut |
| 5 | Washer (Fibre) |
| 6 | Washer (SS) |
| 7 | Ball Locator |
| 8 | Thrust Bearing Assembly |
| 9 | "T" Bolt – Bottom |
| 10 | Circlip |
| 11 | Cheese Head Screw |
| 12 | Counter Thrust Bearing Ring |
| 13 | Journal Bush |
| 14 | Bottom Bearing Housing |
| 15 | Stator Housing Assembly |
| 16 | Rotor with Shaft |
| 17 | Top Bearing Housing |
| 18 | "T" Bolt – Top |
| 19 | Gasket |
| 20 | Cable Box |
| 21 | Hexagonal Nut |
| 22 | Oil Seal |
| 23 | Sand Guard - Stationary |
| 24 | Sand Guard - Rotary |
| 25 | Stud |
| 26 | Hexagonal Nut |
| 27 | Coupling |
| 28 | Coupling Key |
| 29 | 3 Core PVC Insulated Cable |
| 30 | Plug |
| 31 | Cable Gland |
| 32 | Oval Washer |
| 33 | Key |
| 34 | Washer |
| 35 | Drain Plug |
| 36 | Hex. Headed Bolt |

Cross-section view of Three Phase 7 inch Submersible Mixed Flow Pump is shown below in Fig. 3:

Fig. 3 Cross-section view of 7 inch mixed flow submersible pump



| No. | PART NAME |
|-----|--------------------------|
| 1 | Inlet Bracket |
| 2 | Strainer |
| 3 | Distance Sleeve |
| 4 | Bush - Int / Top Bowl |
| 5 | Stepped Sleeve - Hcp |
| 6 | Stud & Hex. Nut |
| 7 | Bowl Ring |
| 8 | Impeller Sealing Ring |
| 9 | Bush |
| 10 | Bowl - Stage |
| 11 | Gasket - Circular |
| 12 | Bowl - Top |
| 13 | Cap |
| 14 | NRV Seat |
| 15 | NRV |
| 16 | Bush - Nrv Guide |
| 17 | Delivery Casing |
| 18 | Cable Guard Clamp |
| 19 | Lock Nut |
| 20 | Top Sleeve - Hcp |
| 21 | Parallel Key |
| 22 | Pump Shaft |
| 23 | Impeller |
| 24 | CSK Screw |
| 25 | Cable Gaurd |
| 26 | Hex Socket Set Screw KCP |

9. Pre-installation requirements

Arrangement for Installation

- ✓ Use the services of a professional and trained mechanic with experience in erecting borewell submersibles
- ✓ Ensure proper safety precautions during installation
- ✓ Ensure the availability of electrical power as indicated in Table 1

General Installation Precautions

- ✓ Open packaging and note down the Serial number and Model for future reference
- ✓ Inspect the purchased pump for damage / leakage
- ✓ Ensure all fasteners are tightened properly
- ✓ Check the inside diameter of well casing to ensure that it is not smaller than the size of the submersible
- ✓ Check depth of borewell to determine the length of piping and power cable required



Note

If you detect damage or discrepancy in the product, contact the dealer from whom the pump was purchased



Warning

Do not use this pump for oil or toxic, acidic, corrosive, and / or flammable liquids Pumping flammable liquids could cause explosion








Caution

Do not use the pump cable for lifting / lowering pump

| | |
|--|---|
|  <p>Caution</p> | <p>Use trained professionals to install the submersible pump. Improper fitment can cause pump to fall into the bottom of the bore</p> |
|  <p>Warning</p> | <p>Use a power supply cable that has sufficient rating and has been exclusively provided for the pump. Factor in low-voltage operation</p> |
|  <p>Warning</p> | <p>Provide proper Earthing as improper Earthing can cause electrical shock</p> |
|  <p>Caution</p> | <p>Use a Megger to verify the insulation resistance of the motor. Insulation resistance should be 20MΩ minimum</p> |
|  <p>Caution</p> | <p>Do not place submersible pump with its base resting at the bottom of the borewell. There is a possibility for the motor and pump to be buried in the silt which collects at the bottom of the borewell</p> |
|  <p>Warning</p> | <p>Mount the pump vertically. Never inclined or horizontal</p> |

Operation Precautions

| | |
|--|---|
|  <p>Caution</p> | Do not run the pump dry. It could lead to product damage |
|  <p>Warning</p> | Switch OFF power supply and ensure that impeller completely stops before changing rotation or making any adjustments |
|  <p>Caution</p> | Do not use this pump for pumping liquid exceeding 33°C as this may lead to product failure |
|  <p>Warning</p> | Do not switch ON the pump if there is any human contact with the pumped medium. If any electrical leakage occurs, this could be fatal |
|  <p>Note</p> | It is recommended to use a starter with single phase preventer, overload relay, and dry-run protector |

10. Installation procedure

Please follow below procedure to install the pump and motor.



Caution

The supply voltage should be within -15% to +6% of rated voltage. Water temperature for operation of the pump should not exceed 33°C Failure to observe the precautions given above could cause the pump to malfunction which may lead to current leakage or electrical shock.

Installation:

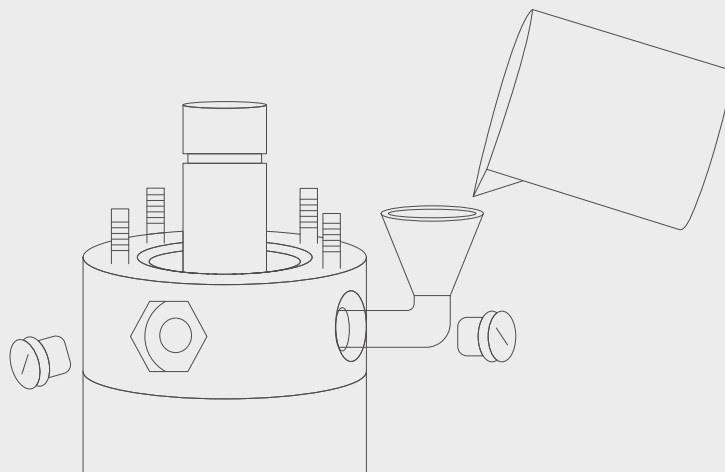
The submersible motor is supplied pre-filled with a mixture of clear cold drinking water and anti-corrosive liquid. The following steps are executed prior to installation:

- ✓ Position the motor vertically on its base
- ✓ Check if all fasteners are tight. Tighten if required
- ✓ The two threaded plugs provided on the circumference of the cable box are removed as shown in Fig. 4 below.

▼ Fig. 4 Topping up Submersible Motor with Pure Drinking Water

Check water level in the motor and if required, top up with clear drinking water.

Air bubbles, if any, are removed by gently rocking the motor to and fro.



- ✓ The two threaded plugs are then re-assembled, ensuring the motor is encapsulated
- ✓ Dry the exterior of the motor and check thoroughly for water leakage
- ✓ If there is no leakage, the motor is now ready for coupling with the pump and then installation
- ✓ Place the motor key in the motor shaft keyway and then slide the coupling over the motor shaft until it rests on the sand guard

Checking Insulation Resistance

- ✓ Before submerging the unit, measure the Insulation Resistance using a Megger of 500 VDC
- ✓ Ensure contact points are clean
- ✓ Connect measuring cable to the ground conductor
- ✓ Connect the other measuring cable to every core of the motor cable in succession
- ✓ Ensure that the insulation resistance as shown on the Megger is a minimum of 20MΩ

Waterproofing the Submersible Motor Cable - Supply Cable Joint



Danger

Hazardous voltage will cause death, serious injury, electrocution.

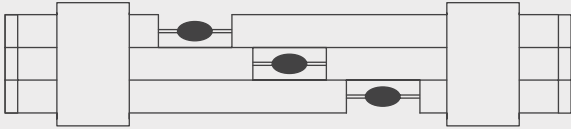
Disconnect all power before working on this equipment and that it cannot be accidentally switched ON.

- ✓ Submersible Motors are supplied with a 3-core PVC-insulated flat cable of length 3 metres
- ✓ The free end of the 3-core cable of the motor needs to be connected to supply cable from the starter
- ✓ As this joint is always nearly submerged in water, the joint needs to be waterproof

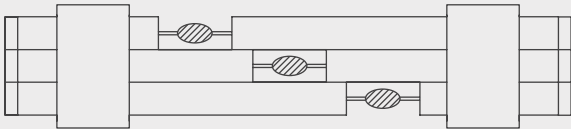
Refer the sequence shown in Fig. 5 below for insulating the cable joint for underwater application:

Procedure for joining and insulating the 3 core conductors

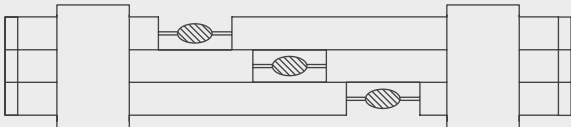
Step 1: Soldering / knot the copper strands



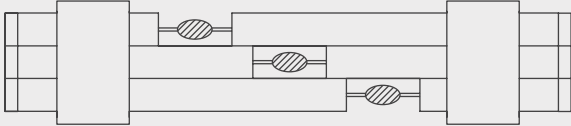
Step 2: Layer 1 - 1st layer of virgin rubber insulation



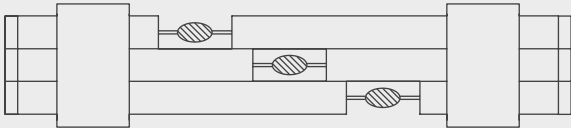
Step 3: Layer 2 - 1st layer of PVC insulation tape



Step 4: Layer 3 - 2nd layer of virgin rubber insulation

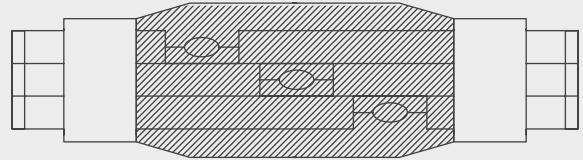


Step 5: Layer 4 - 2nd layer of PVC insulation tape

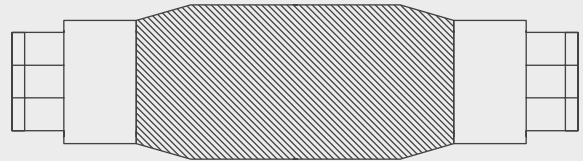


Procedure for joining and insulating the cable joint for under-water cable

Step 6: Layer 1 - 1st layer of virgin rubber insulation



Step 7: Layer 2 - 1st layer of PVC insulation tape



Step 8: Layer 3 - 2nd layer of PVC insulation tape

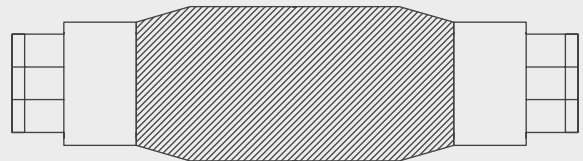


Fig. 5 Cable Joint for Under Water Application

Checking direction of rotation of Motor



Danger

Hazardous voltage will cause death, serious injury, electrocution.
All electrical work must be performed by an authorised electrician in compliance with local electrical equipment standards & internal wiring codes.

- ✓ After waterproofing the joint connecting the submersible motor cable and supply cable, check if direction of rotation of the motor shaft matches the direction marked on the visible cable box top face
- ✓ The direction of rotation is counter-clockwise when viewed from the motor shaft end as marked on the cable box
- ✓ Connect free ends of the cable to starter and energize the motor for a second or two
- ✓ For added protection, continuously pour clean water over the sand guard to remove heat generated
- ✓ If the direction of rotation is in the same direction as that marked on the cable box face, the connections are correct
- ✓ In case the direction of rotation of the motor shaft does not match the marking on the cable box, interchange any two lead wires at the starter and confirm as before
- ✓ In case the direction of rotation of the motor shaft does not match the marking on the cable box, interchange any two lead wires at the starter and confirm as before.

Coupling submersible motor to pump



Danger

Hazardous voltage will cause death, serious injury, electrocution.
Disconnect all power before working on this equipment and that it cannot be accidentally switched ON.

To couple the submersible motor and pump, follow the following procedure:

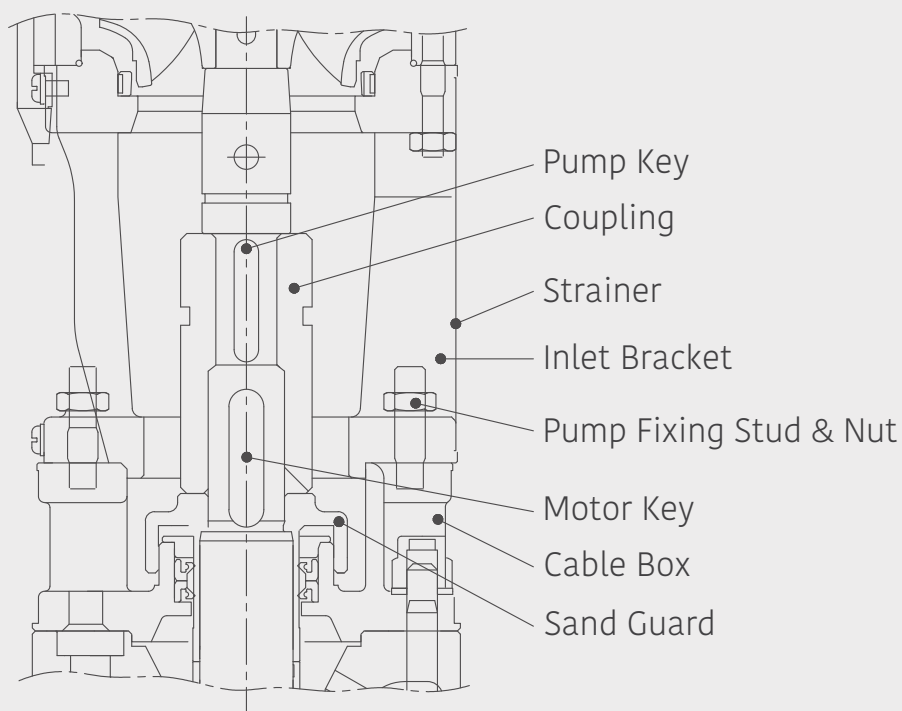
- ✓ The tripod with chain block is erected
- ✓ Unpack submersible pump and remove cable guard and strainer
- ✓ Keep the submersible motor vertical

- ✓ Apply threading compound to internal thread on the delivery casing and external threaded portion of the short length delivery pipe to be fitted to the delivery casing
- ✓ Screw the short length of delivery pipe to the delivery casing

Refer Fig. 6 below for coupling the submersible motor to the pump:

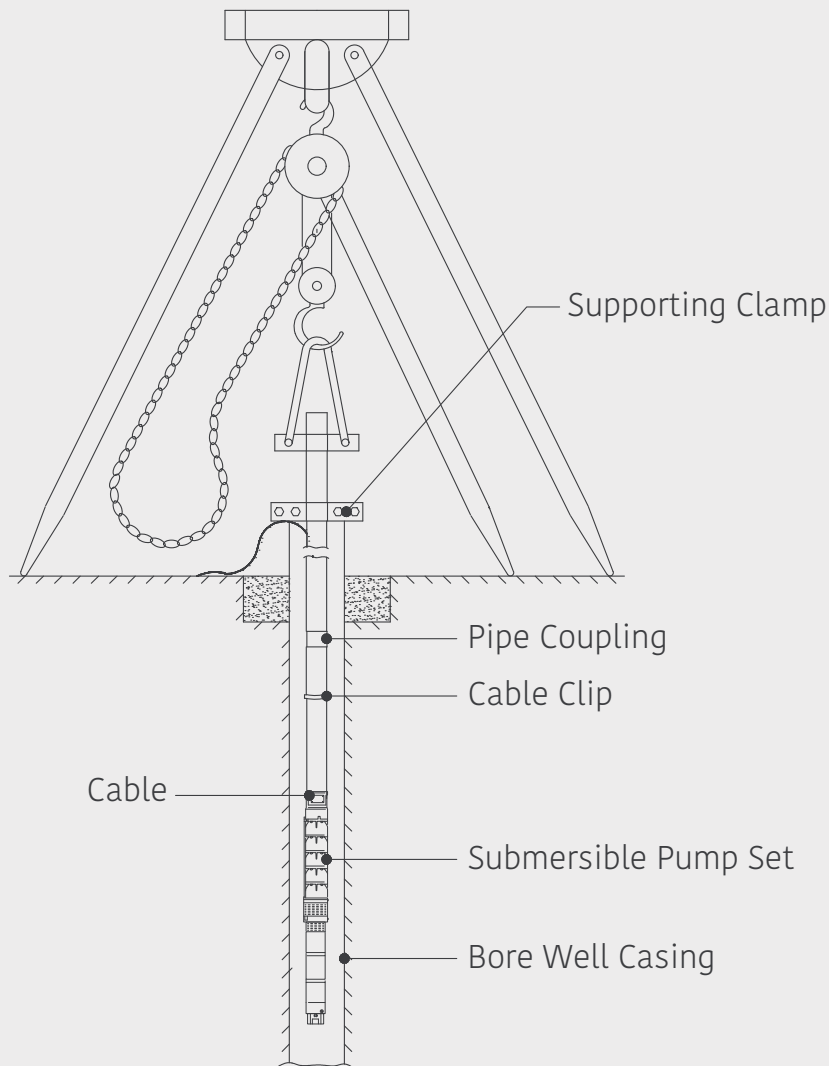
- ✓ Locate the pump key in pump shaft keyway
- ✓ Carefully lower pump in such a way that the pump shaft is inserted into the coupling while ensuring that pump shaft key is aligned with keyway in the coupling
- ✓ Ensure that studs on the motor should pass through the holes in the bottom portion of the inlet bracket and that the face of inlet bracket rests on top of the motor seating face
- ✓ Using hexagonal nuts, tighten inlet bracket to cable box of the motor
- ✓ Check the play by lifting the coupling with pump shaft
- ✓ Now fit the cable guard and strainer back in position

▼ Fig. 6 Motor and Pump assembly with Coupling



Fit the supporting clamp to delivery pipe and suspend the submersible pump from the chain block (Refer Fig. 7).

✓ **Fig. 7 Typical tripod stand for lowering / lifting submersible pump sets**



Arrangement for installation

- ✓ Use services of a professional and trained mechanic with experience in erecting borewell submersible
- ✓ While lowering pumpset, ensure that the cable does not get damaged
- ✓ Use cable clips to keep cable as close as possible to the pipe
- ✓ Ensure that suspended submersible pump has a secondary support to prevent the set from falling to the bottom of borewell

Electrical installation

Check power supply voltage and frequency and compare with the product requirements specified on the nameplate.

- ✓ Observe relevant EB regulations while providing power supply to the motor
- ✓ Ground the Submersible Motor
- ✓ Ensure the joint is waterproof as cable joint is submerged in water
- ✓ The cable must not be coiled if it is of extra length. Any excess should be cut off before the connections are made
- ✓ Connect the cable properly to starter terminals

Starter



Warning

Failure to use correct starting equipment and overloads may damage your Submersible Motor. This damage may not be covered by warranty.

It is recommended that the starter incorporate the following:

- ✓ Contactors of sufficient current ratings with overload relay
- ✓ Over voltage and under voltage protection
- ✓ Phase failure protection
- ✓ Dry-run preventer
- ✓ Ammeter and Voltmeter to display current and voltage

Cable Lead Wire Connection to Starter

Direct online starter

| Cable | Terminal |
|--------|----------|
| Red | U |
| Yellow | V |
| Blue | W |

Star delta starter

| Cable 1 | Terminal |
|---------|----------|
| Red | U1 |
| Yellow | V1 |
| Blue | W1 |

| Cable 2 | Terminal |
|---------|----------|
| Red | U2 |
| Yellow | V2 |
| Blue | W2 |

Cable Selection

Refer TABLE 2 for the selection of cables from Starter to Submersible Motor:

Submersible Cable Selection Chart (For 415 V, 50 Hz Ac power supply)

| FL Current (Amps) | Motor Rating | | Cable size in Sq.mm | | | | | | | | |
|-------------------------|--------------|---------|-----------------------------------|-----|-----|-----|------|------|------|------|------|
| | | | 1.5 | 2.5 | 4.0 | 6.0 | 10.0 | 16.0 | 25.0 | 35.0 | 50.0 |
| | KW | HP | Maximum Length of Cable in Metres | | | | | | | | |
| 2.75 | 0.75 | 1 | 262 | 437 | 705 | | | | | | |
| 3.25 | 1.1 | 1.5 | 222 | 370 | 596 | 895 | | | | | |
| 4.5 | 1.5 | 2 | 160 | 267 | 430 | 646 | | | | | |
| 6.5 | 2.2 | 3 | 111 | 185 | 298 | 447 | 773 | | | | |
| 8.5 | 3 | 4 | 84 | 141 | 228 | 342 | 590 | 933 | | | |
| 10 | 3.7 | 5 | 72 | 120 | 193 | 290 | 502 | 793 | | | |
| 12 | 4.5 | 6 | 60 | 100 | 161 | 242 | 426 | 661 | | | |
| 14.5 | 5.5 | 7.5 DOL | | 82 | 133 | 200 | 346 | 547 | | | |
| 14.5 | 5.5 | 7.5 SD | 86 | 143 | 231 | 347 | 600 | 947 | | | |
| 18 | 6.7 | 9 | 89 | 115 | 186 | 279 | 483 | 763 | | | |
| 19.5 | 7.5 | 10 | 69 | 106 | 172 | 258 | 446 | 704 | | | |
| 25 | 9.3 | 12.5 | 64 | 83 | 134 | 201 | 348 | 549 | 852 | | |
| 29 | 11 | 15 | | 71 | 155 | 173 | 300 | 473 | 735 | | |
| 34 | 13 | 17.5 | | | 98 | 148 | 256 | 404 | 626 | 822 | |
| 39 | 15 | 20 | | | 87 | 129 | 223 | 352 | 546 | 769 | |
| 43 | 18.5 | 25 | | | 78 | 117 | 202 | 319 | 495 | 697 | |
| 52 | 22.5 | 30 | | | | 96 | 167 | 264 | 409 | 577 | 828 |
| 60 | 26 | 35 | | | | | 145 | 229 | 355 | 500 | 717 |
| 65 | 30 | 40 | | | | | 133 | 211 | 327 | 461 | 662 |

Notes:

- Table shows maximum allowable length of submersible cable for the given full load current where site voltage is normal ie 415 V
- For other voltages, the cable size is to be selected for the length which is calculated as follows
- Calculated length = $(415 / \text{Actual voltage}) \times \text{Actual length}$
- 7.5 HP and above are SD motors. For these motors, the actual current is $1/\sqrt{3}$ the FL current
- The cable size and maximum allowable length are arrived at accordingly

Electrical wiring work



Warning

All electrical work must be performed by an authorised electrician in compliance with local electrical equipment standards and internal wiring codes. Improper wiring can lead to current leakage, electrical shock, or fire. Provide a dedicated (ELCB) earth leakage circuit breaker, Single-phase preventer, dry-run preventer, and overload preventer for the submersible pump. Failure to follow this warning can cause electrical shock or explosion when the product fails or an electrical leakage occurs.

Operate well within the capacity of the power supply and wiring.

Earthing



Warning

Be sure to install the ground wire securely. Failure to observe this precaution could damage the pump and cause current leakage, which may lead to electrical shock



Caution

Do not connect the ground wire to a gas pipe, water pipe, lightning rod, or telephone ground wire. Improper grounding could cause electrical shock

Connecting the power supply



Caution

Observe relevant Electricity Board regulations while powering up the Pumpset



Warning

Before inserting the power plug or connecting the wires to terminal board, make sure that power supply is properly disconnected. Failure to do so may lead to electrical shock, short, or injury caused by the unintended starting of pump.



Caution

Do not use damaged cables, power plugs, or loose power outlets. Failure to observe this precaution could lead to electrical shock, short circuit, or fire.

Precautions during installation



Warning

When installing the pump assembly, ensure that it is suspended properly from the tripod stand or else the pump will fall into the bottom of the bore and which is difficult to retrieve. Provide backup



Caution

When installing or moving the pump, never suspend the pump by the cable. Doing so will damage the cable, which may cause current leakage, electrical shock, or fire.

Start-up



When the pump has been connected correctly, direction of rotation confirmed, and submerged in water, it should be started with the gate valve closed off to approximately 1/3 of its maximum volume of water



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 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 inlet bracket



If the borewell yield is less than the discharge of the pump it is recommended to have a dry run protection device



If the water level approaches the inlet bracket, there is likelihood of air being drawn into the pump along with water. This can reduce the life of hydraulic components and damage the pump



Warning

If you find any abnormalities like vibration, noise, smell, etc., from the pump during trial operation, switch OFF the pump and contact the dealer from whom this pump was purchased

11. Basic troubleshooting



Warning

To prevent serious accidents, disconnect the power supply before inspecting pump.

Read this Operation Manual thoroughly before requesting repair. Contact the dealer from whom this equipment was purchased. Servicing and troubleshooting must be handled by qualified persons with proper tools and equipment. Common faults, root cause for these, and suggested actions are provided in TABLE 3 below:

| Fault | Possible causes | Suggested actions |
|-----------------------|--|---|
| The pump does not run | No electricity supply | Check the line. Contact local EB authorities |
| | Single-phase preventer mounted in the starter switches OFF due to absence of one phase / phase reversal. | Check the line and wait for electricity to be restored. If phase has been reversed, interchange any two power cables |
| | Blown fuse | Check and replace / rectify the fuse |
| | Defective motor winding | Rewind the motor |
| | The motor starter device is defective | Repair / replace the starter device |
| | Damaged coupling | Take out the pump set to check for coupling damage, replace coupling if necessary |
| | The dry-run protector has cut-off the electricity supply to the pump due to low water level | Check the borewell yield, if the yield is less, reduce the discharge using a gate valve or wait for the water level to rise |
| | Faults in cable joints /Loose connections | Check the connections and make proper joints |
| | The motor starter overload has tripped | Reset the motor starter overload. If it trips again, check the voltage. If the voltage is OK, replace over load relay |
| ELCB has tripped out | Reset the ELCB, If trips again check the insulation resistance of the motor | |

| Fault | Possible causes | Suggested actions |
|---------------------------------|---|--|
| Less discharge from pump | Available voltage is less | Check for loose connections or contact EB authorities. If needed, replace the cable |
| | Wrong direction of rotation | Interchange the supply connections of two phases |
| | Increase in draw-down | Lower the pumpset or wait for water level to rise |
| | Change in actual static head | Check the static head |
| | Leakage in pipes | Change pipes that have leakages |
| | Excessive wear of pump components mainly Impeller, wearing ring, etc., due to high sand content and prolonged operation | Replace the worn-out parts |
| | Discharge pipe coated with depositions | Clean the pipe and remove depositions |
| | Foreign bodies lodged in impeller | Lift the pump and clean the impellers |
| | The drawdown is larger than anticipated | Lower the pump if specification meet the required head. If not, change the pump as per the required head |
| | The valves in the discharge pipe is partly closed / blocked | Check and clean / replace the valves if necessary |
| | The discharge pipe is partly choked by impurities | Check / replace the discharge pipe |
| | NRV of the pump is partly blocked | Pull out the pump and check / replace the valve |
| | Pump and the riser pipe are partly choked by impurities | Pull out the pump. Check and clean or replace pump if necessary. Clean pipes |
| The pump is defective | Repair / replace pump | |
| Total head developed is too low | Excessive wear of pump components mainly Impeller, wearing ring, etc. due to high sand content and prolonged operation | Replace the worn-out pump parts |
| | Discharge pipe coated with deposits | Clean the pipe and remove the deposits |

| Fault | Possible causes | Suggested actions |
|--------------------------------|---|---|
| Current consumption in excess | Single-phasing | Check line fuses / availability of three-phase supply |
| | Voltage too low | Check voltage |
| | Defective rotor | Change rotor |
| | Winding insulation inadequate | Change winding |
| | Faulty motor radial and thrust bearing | Change worn-out bearings |
| The pump runs but no discharge | The discharge valve is closed | Open the valve |
| | No water or too low water level in the borehole | Lower the pump if head is within the specification |
| | The NRV is stuck in its shut position | Pull out the pump and clean / replace the valve |
| | The inlet strainer is choked up | Pull out the pump and clean the strainer |
| | The pump is defective | Repair / replace the pump |



Note

Conduct trial operation after maintenance



Note

Dispose replaced components and oil with appropriate care so as to protect the environment



Warning

Do not try to solve unspecified troubles of pump as it may lead to severe damage to the pump or injury to personnel. Contact the dealer from whom this pump was purchased



12. Preventive maintenance checks

A definite schedule of preventive maintenance inspections should be established to avoid breakdown, serious damage, and / or extensive downtime. The schedule will depend on operating conditions and experience with similar equipment. The below checklist does not represent an exhaustive survey of maintenance steps necessary to ensure safe operation of the submersible pump.



Warning

The pump must not be operated with the delivery valve shut-off for more than a few seconds; otherwise the motor will overheat, possibly causing permanent damage



Warning

Utilize the services of certified electrician to carry out electrical measurements / checking the functioning of starter



Taro Submersible Pumps do not require frequent maintenance



However, it is good practice to monitor the conditions and performance of the pump and motor

Diagnosis may be carried out by checking the following:



Close the delivery valve and check the shut-off head generated by pump



Check the current drawn by the pump at the duty flow rate



Both these data should be compared to corresponding data recorded when the unit was initially installed



Any reduction in shut-off head may indicate wear of the pump hydraulics



Any increase in motor current at duty flow rate indicates a possible overload condition



Under running conditions, intentionally disconnect any one phase and check if single-phase Preventer workst

Maintenance precaution



Warning

Disconnect the power supply before starting maintenance or inspection of the pump to avoid electrical shock



Note

If you find any damages or abnormalities, switch OFF the pump and report the problem to the dealer from whom the set was purchased

NOTE: The manufacturer assumes no responsibility for damage or injury due to disassembly in the field.

13. Do's and don'ts

| Do's | Don'ts |
|---|--|
| Prior to installation, check water level in submersible motor. If required, top up with clear and clean drinking water. Do not forget to replace water filling plugs after filling | Do not erect pumpset at the very bottom of the bore hole. Ensure at least 3 m clearance from bottom |
| Check direction of rotation of motor before coupling it to the pump | Do not operate with NRV and Strainer removed |
| Use proper size of cable from starter to motor. Factor in operation at lower voltages | Do not permit use of multiple joints for making up the length of cable. Instead use a single cable from starter to submersible motor cable free end to reduce voltage drop |
| Connect pump to a starter with single phase, dry-run, and overload protectors | Do not operate pump at shut-off conditions as the temperature of water will rise resulting in overheating of components |
| Check for play and freeness of rotation of pump-motor shaft before installation | Do not test the pump outside the bore in dry condition as the seals and bearings will get damaged |
| Check for loose of fasteners | Do not ground to a gas supply / water line |
| Check for leakages from motor | Do not lift / lower product using the cable harness |
| When the drop cable must be spliced or connected to the motor leads, ensure that the splice is water tight | Do not subject product to shock loads |
| All wiring, electrical connections, and system grounding must comply with local Electricity Board regulations. It is essential to ground the unit to prevent electrical shock. Provide Earthing through the screws provided on the motor body | Do not attempt to repair set. Approach the dealer from whom the set was purchased |
| While coupling the pump and motor, ensure that the key is in place | Do not install pump without checking water level in the motor body |
| Ensure motor insulation resistance between phases and Earth is greater than 20MΩ | Do not operate pump with very low / intermittent discharge. In such cases throttle the discharge to avoid dry-running |

Do's

If a plastic well casing is used in your installation, ground the metal well cap or well seal

When not in use, run the pump at least a few minutes a day

Don'ts

Do not perform frequent Megger tests on the winding as the winding insulation can weaken

Do not use oversized fuse wires as this can cause the motor winding to be damaged due to starter failure / short circuiting.

14. Important safety instructions

Only qualified personnel should be involved for inspection, maintenance, and repairs. The successful and safe operation of such a product depends on proper handling, installation, and maintenance. It is suggested that in case of non-functioning of the product, the customer is requested to contact the dealer through whom the purchase was made.



Danger

Hazardous voltage will cause death, serious injury, electrocution.
Disconnect all power before working on this equipment.
Maintenance should be performed by only qualified personnel.

15. Storage & handling



Submersible pumps are supplied from factory in proper packing in which they should remain until they are ready to be installed



The product should be stored in a closed, dry, and well-ventilated room



Do not store the products under direct sunlight



Handle pumps with care and do not expose product to unnecessary impact and shocks



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



Caution

If the motors are stored, the shaft must be turned by hand at least once a month



Caution

If the motor has been stored for more than one year before installation, dismantle the motor and check the rotating parts and rubber components before use



Caution

After a long period of storage, the pumpset should be inspected before it is put in operation. Ensure the impellers can rotate freely



Caution

The unit has water-lubricated journal and thrust bearings and must never be run dry. Starting the pumpset for a short period without water must be avoided entirely as operation under such conditions will damage the bearings.

16. Company contact information

For most up to date information on Texmo Industries, please visit www.taropumps.com



P.B.No. 5303,
Mettupalayam Road,
Coimbatore - 641 029, India

1800-102-8888
www.taropumps.com
info@taropumps.com



**Texmo
Industries**
Est. 1956