

# Six Inch Borewell Submersible Pump Sets

Instruction &  
Operating Manual



**Texmo  
Industries**  
Est. 1956



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# 1. Introduction

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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

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Please refer to your warranty card or visit **[www.taropumps.com](http://www.taropumps.com)** for more information on your warranty.

# 3. Complying standards

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IS 694: Polyvinyl Chloride insulated unsheathed and 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

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

## 5. Information about your pump

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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 pump set so as to ensure reliable operation and performance.

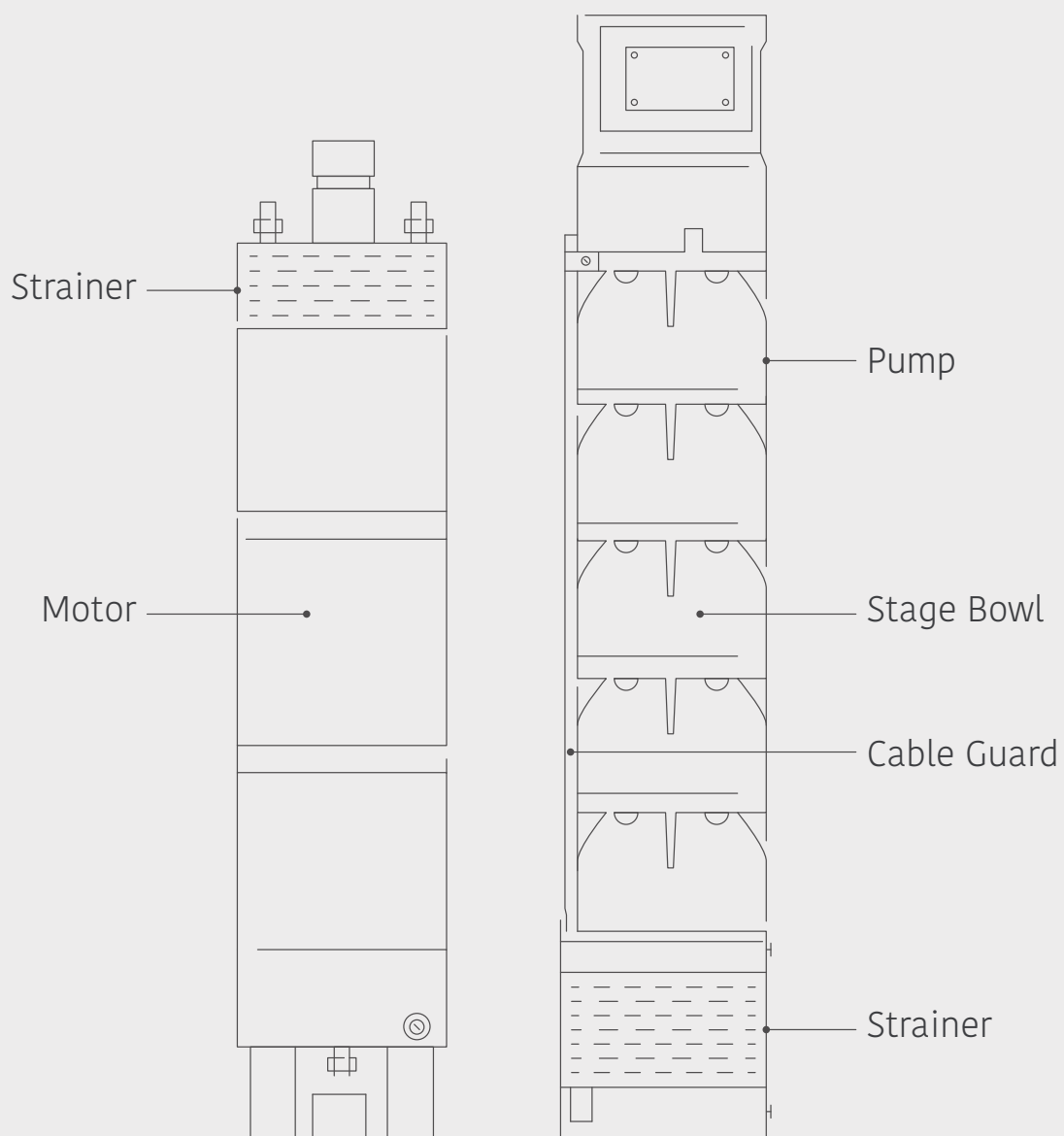
Applications include farm irrigation (Flood / Drip / Sprinkler), domestic and community water supply, water supply to high-rise buildings, municipal water supply, mine dewatering, industrial water supply, cooling water circulation systems, water treatment, firefighting, fountains, aqua culture and salt fields.

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 6 inch Submersible Pump Set is shown below in Fig. 1:

**Fig. 1 View of 6 inch Submersible Pump Set**



## 7. Key specifications & features

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Standard Specifications of 6 inch Bore Well Submersible Pumps are shown below in TABLE 1:

Phase and Power	Three Phase: 3 - 25 HP
Motor Type	Wet
Starting method	< 7.5HP: DOL
	7.5HP: DOL and SD Versions available
	> 7.5HP: SD
Operating Voltage	Three phase Premium: 350 - 440 V Power: 300 - 400 V Prime: 300 - 400 V
Frequency	50 Hz
Speed	2850 rpm
Duty	S1 Continuous
Max. Fluid Temperature	33°C
Impeller Type	Radial / Mixed
Cable	3-core PVC Insulated

### Product Performance Specification

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Texmo Industries has a wide variety of 6 inch Borewell Submersibles to meet your requirements. Please consult our sales team / your nearest dealer to meet your specific requirements.

## Key features: Motor

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- ✓ 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
- ✓ Motor is filled with a mixture of pure clean water mixed with anti-corrosive liquid for improved motor life
- ✓ LTB-4 bush for longer life for motors up to 17.5 HP
- ✓ Carbon bushes for longer life for motors rated above 17.5 HP
- ✓ Motors fitted with copper rotor (except RR series)
- ✓ Equipped with rubber diaphragm to compensate thermal expansion of water
- ✓ Easily re-windable squirrel cage motor
- ✓ High quality seal rings and sand guard to protect motor from sand entry

## Key features: Pump

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- ✓ 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 (except RR series)
- ✓ Bowls cast in CI FG 200 A for better withstanding of sand erosion



- ✓ Stainless steel shafts
- ✓ Cast Steel impeller in all series except TSS
- ✓ Cast Steel integral diffuser and diffuser housing in UH series
- ✓ Cast Steel diffuser in CI FG 200 diffuser housing for other series
- ✓ CI FG 200A integral diffuser and diffuser housing for R series

## Strainer

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- ✓ 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

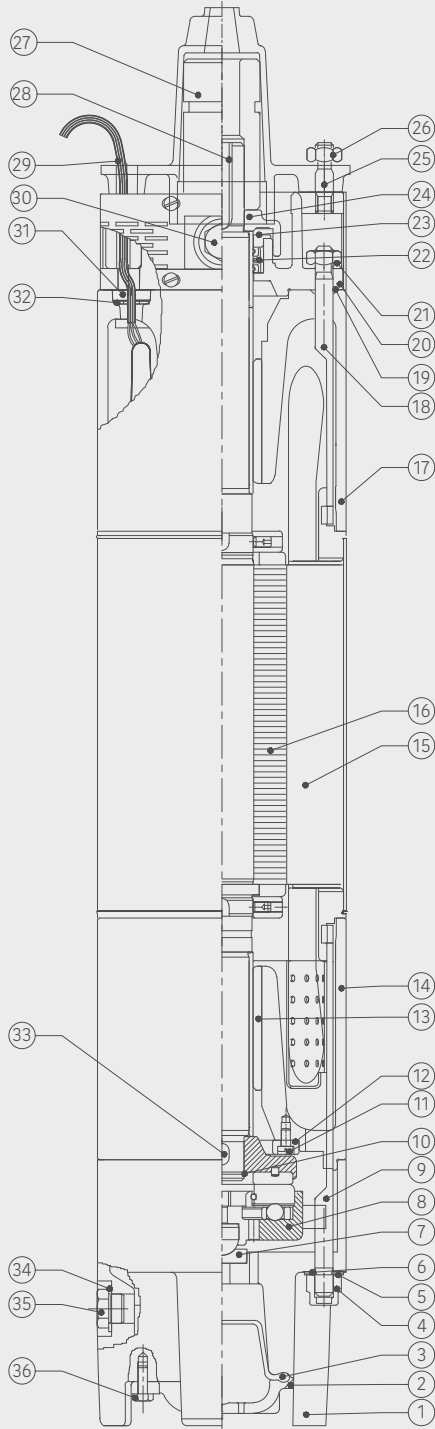
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- ✓ All submersible motors are provided with 3-core PVC insulated flat cable of length 3 metres

# 8. Cross-section view

Cross-section view of Three Phase 6 inch Submersible Motors is shown below in Fig. 2:

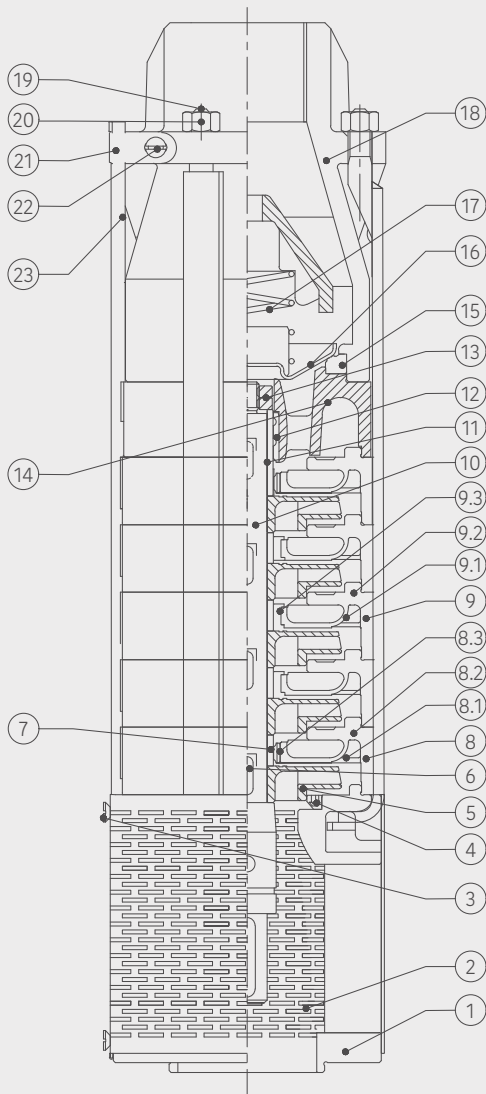
**Fig. 2 Cross-section view of 6 inch three-phase submersible motors**



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 6 inch Radial flow borewell submersible pumps is shown below in Fig. 3:

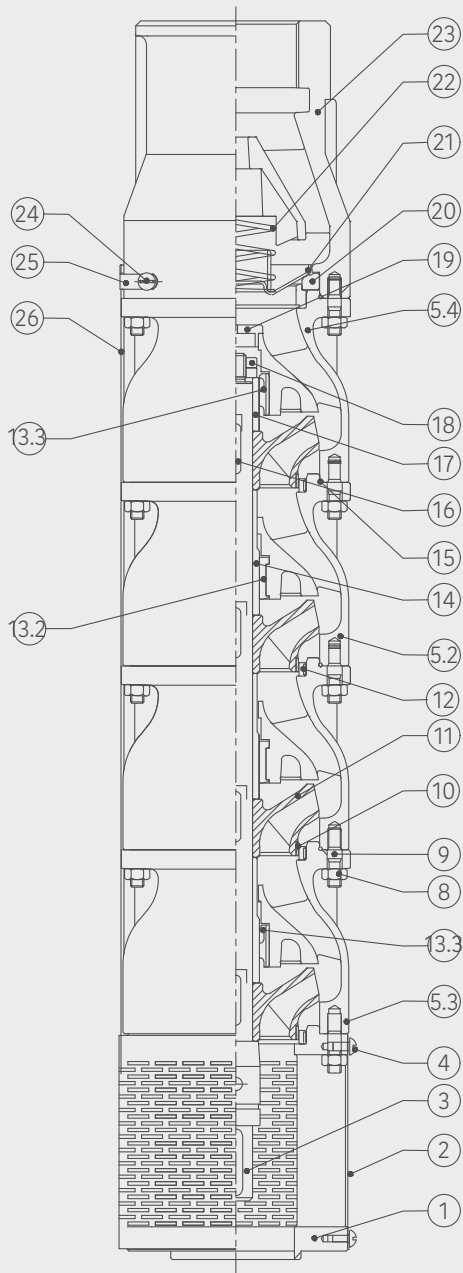
**Fig. 3 Cross-section view of 6 inch radial flow borewell submersible pumps**



No.	PART NAME
1	Inlet Bracket
2	Strainer
3	CSK Screw
4	Inlet Sealing Ring
5	Impeller
6	Key
7	Distance Sleeve
8	Diffuser Housing Assy - Intermediate
8.1	Diffuser
8.2	Diffuser Housing
8.3	Diffuser Bush - Intermediate
9	Diffuser Housing Assy - Stage
9.1	Diffuser
9.2	Diffuser Housing
9.3	Diffuser Bush - Stage
10	Shaft
11	Top Sleeve
12	Pump Bearing Bush / Top Bush
13	Lock Nut
14	Pump Bearing Housing
15	NRV Seat
16	Non-Return Valve
17	NRV Spring
18	Delivery Casing
19	"Tie" Bar
20	Hexagonal Nut
21	Cable Clamp
22	CSK Screw
23	Cable Guard

Cross-section view of 6 inch mixed flow Borewell submersible pump is shown below in Fig. 4:

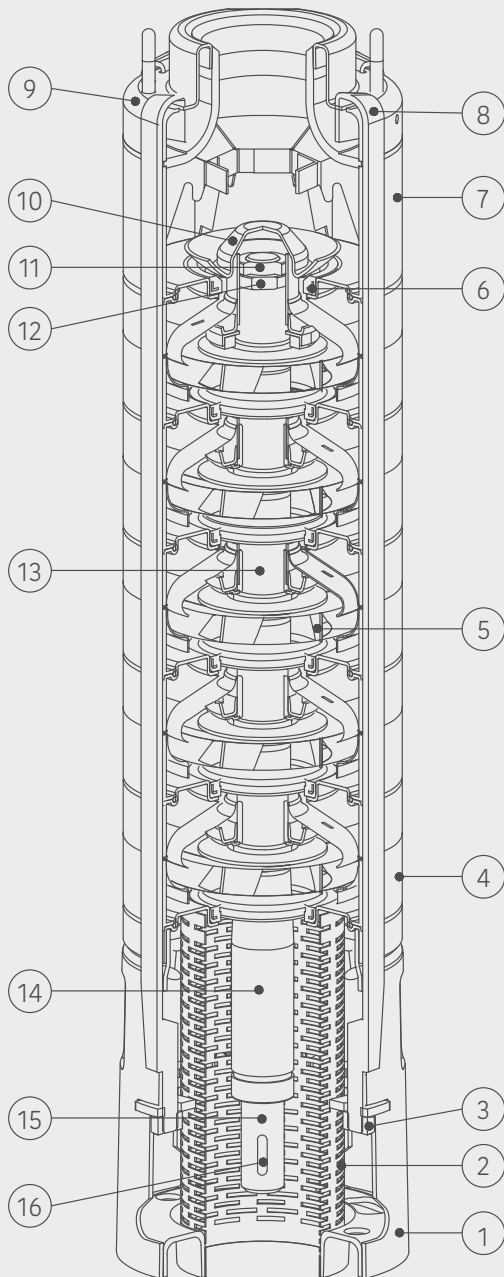
**Fig. 4 Cross-section view of 6 inch mixed flow borewell submersible pump**



No.	PART NAME
1	Inlet Bracket
2	Strainer
3	Pump Shaft
4	CSK Screw
5.1	Inlet Bowl
5.2	Stage Bowl
5.3	Intermediate Bowl
5.4	Top Bowl
6	Counter Thrust Collar
7	Bowl Thrust Ring
8	Hexagonal Nut
9	Stud
10	Impeller Wear Ring
11	Impeller
12	Bowl Ring
13.1	Inlet Bowl Bush
13.2	Stage Bowl Bush
13.3	Intermediate /Top Bowl Bush
14	Distance Sleeve
15	Stage 'O' Ring
16	Impeller Key
17	PumpTop Sleeve
18	Lock Nut
19	Sand Protective Cap
20	NRV Seat
21	Non-Return Valve
22	Bush-NRV Guide / NRV SPRING
23	Delivery Casing
24	CSK Screw
25	Cable Clamp
26	Cable Guard

Cross-section view of 6 inch radial flow stainless steel borewell submersible pump, TSS Series, is shown below in Fig. 5:

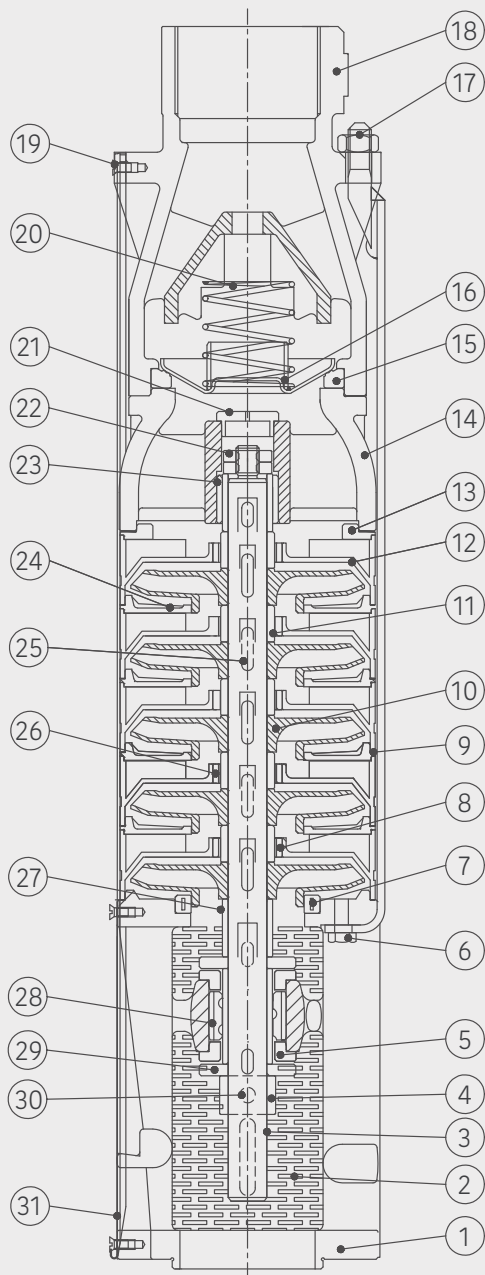
**Fig. 5 Cross-section view of 6 inch radial flow stainless steel borewell submersible pump**



No.	PART NAME
1	Inlet Bracket
2	Strainer
3	Hexagon Nut
4	Bowl Stage
5	Impeller
6	NRV Seat
7	Bowl Top
8	Tie Bar
9	Delivery Casing
10	NRV
11	Lock Nut
12	Nut
13	Sleeve
14	Distance Sleeve
15	Pump Shaft
16	Parallel Key

Cross-section view of 6 inch radial flow ultra head borewell submersible, TRS UH Series, is shown below in Fig. 6:

**Fig. 6 Cross-section view of 6 inch radial flow ultra head borewell submersible pump**



No.	PART NAME
1	Inlet Bracket
2	Strainer
3	Sub Pump Shaft
4	Distance Sleeve
5	Inlet Thrust Ring
6	Hex Head Bolt
7	Inlet Seal Ring
8	Bush
9	Gasket - Circular
10	Impeller
11	Sleeve
12	Diffuser Housing
13	Cover Plate Top
14	Pump Housing
15	NRV Rubber Seat
16	Non Return Valve
17	Tie Bar & Hex Bolt
18	Delivery Casing
19	CSK Screw
20	Compression Spring
21	Cap
22	Lock Nut
23	Bush
24	Cover Plate
25	Parallel Key
26	Bush - Intermediate
27	Sleeve
28	Inlet / Bowl Bush
29	Collar
30	Hex Socket Set Screw
31	Cable Guard

# 9. Pre-installation requirements

## Arrangement for Installation

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- ✓ Use the services of a professional and trained mechanic with experience in erecting borewell submersibles
- ✓ Ensure proper safety during installation
- ✓ Ensure availability of three-phase power

## General Installation Precautions

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- ✓ 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, acetic, 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</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>Note</p>	<p>It is recommended to use a control panel with single phase protector, dry run protector, and overload protector</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 bore well</p>
 <p>Warning</p>	<p>Mount the pump vertically. Never inclined or horizontal</p>



## Operation Precautions

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 <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>	For three-phase models, it is recommended to use a starter with Single-Phase preventer, overload relay, and dry run protection

# 10. Installation procedure

Please follow below procedure to install the pump and motor.



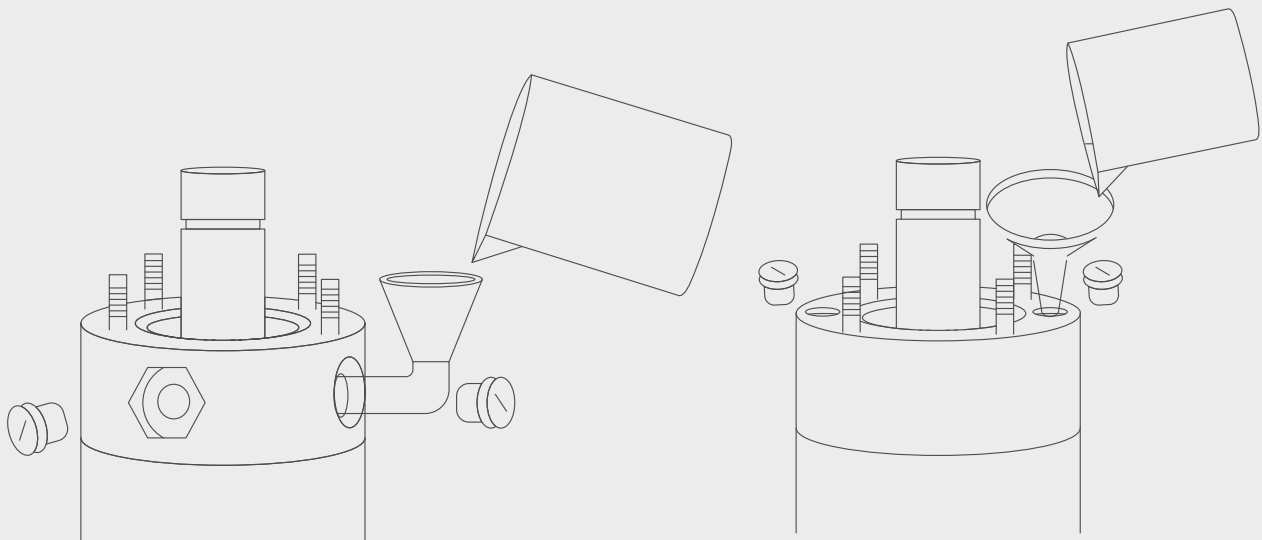
Caution

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 at the top / circumference of the cable box are removed as shown in Fig. 7 below.



**▲ Fig. 7 Topping up Submersible Motor with pure drinking water**

Check the motor and if required, top up the motor with clear cold drinking water.  
Air bubbles, if any, are removed by gently rocking the motor to and fro.  
Check water level in the motor and if required, top up with cold clear water.

- ✓ 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

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Danger

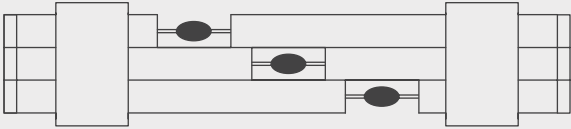
Hazardous voltage will cause death, serious injury, electrocution.  
Disconnect all power before working on this equipment and that it cannot be accidentally switched ON.

- ✓ 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 control panel
- ✓ As this joint is always nearly submerged in water, the joint needs to be waterproof

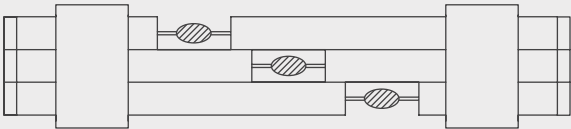
Refer the sequence shown in Fig. 8 below for insulating the cable joint for underwater application:

**Procedure for joining and insulating the 3 core conductors**

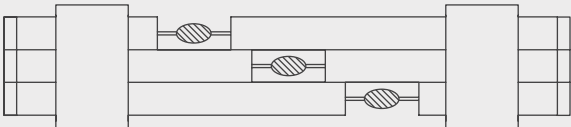
**Step 1:** Soldering / knot the copper strands



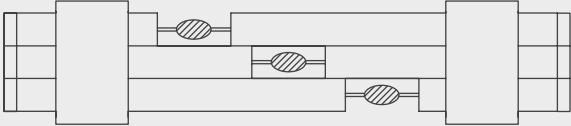
**Step 2:** Layer 1 - 1st layer of virgin rubber insulation



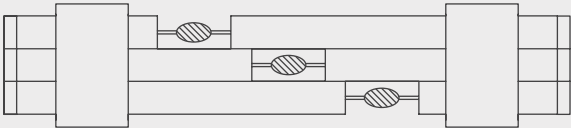
**Step 3:** Layer 2 - 1st layer of PVC insulation tape



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

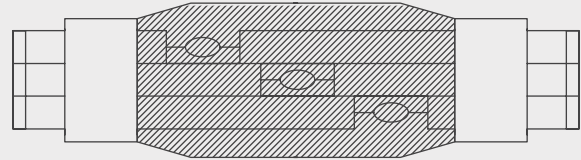


**Step 5:** Layer 4 - 2nd layer of PVC insulation tape

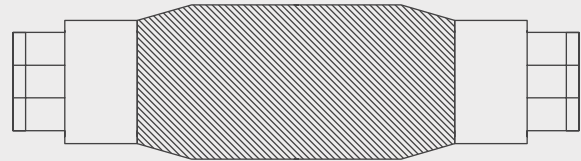


**Procedure for joining and insulating the cable joint for under-water cable**

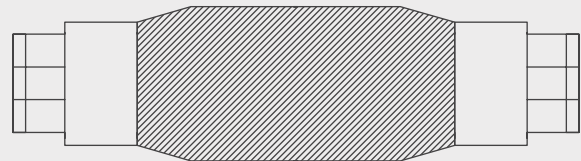
**Step 6:** Layer 1 - 1st layer of virgin rubber insulation



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



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



**Fig. 8 Cable Joint for Under Water Application**

## Checking direction of rotation of Motor

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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 control panel and energize the motor for a second or two



For added protection, continuously pour clean water over the sand guard to remove heat generated



Check the direction of rotation of the motor shaft



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 control panel and confirm as before

## Coupling submersible motor to pump

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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



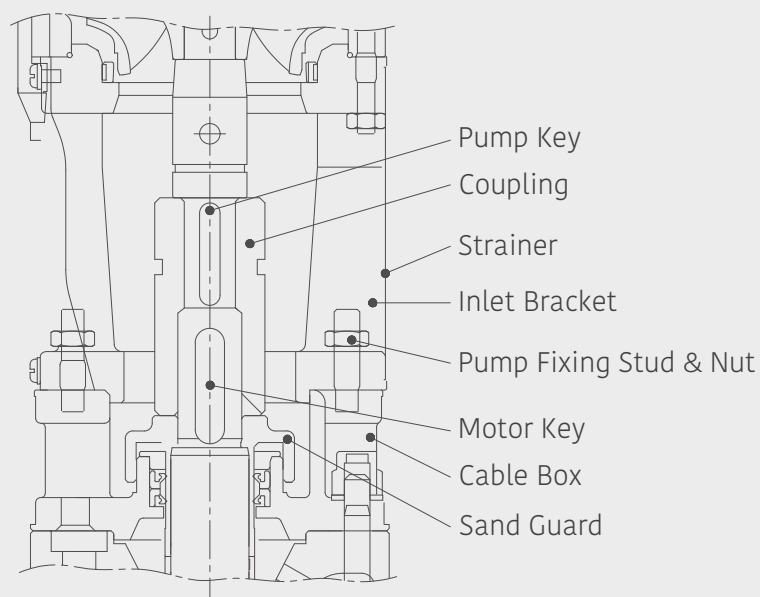
Unpack the submersible pump and remove the cable guard and strainer

- ✓ 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. 9 below for coupling the submersible motor to the pump:

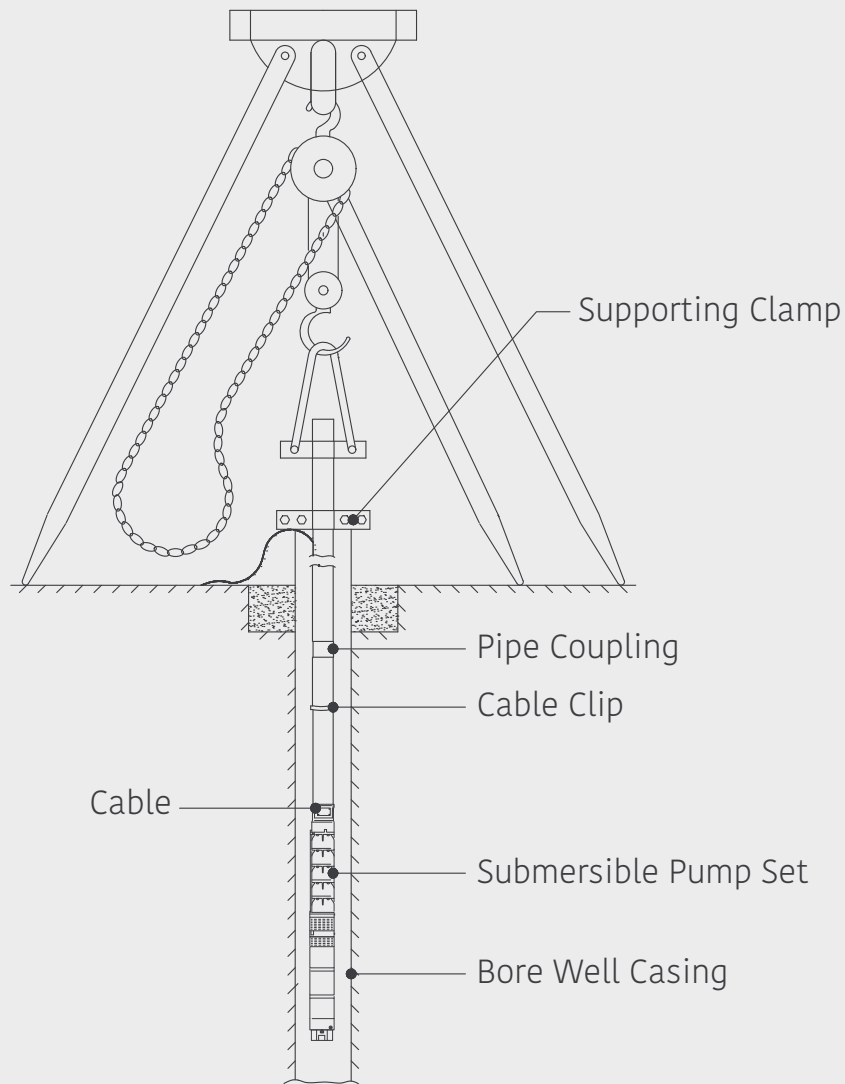
- ✓ Locate the pump key in pump shaft keyway
- ✓ Carefully lower pump in such a way that the pump shaft is inserted into the coupling while ensuring that pump shaft key is aligned with keyway in the coupling
- ✓ Ensure that studs on the motor should pass through the holes in the bottom portion of the 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. 9 Motor and Pump assembly with Coupling**



Fit the supporting clamp to delivery pipe and suspend submersible pump from the chain block (Refer Fig. 10).

✓ **Fig. 10 Typical tripod stand for lowering / lifting submersible pump sets**



## Arrangement for installation

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Use the 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

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

- ✓ Observe relevant EB regulations while giving power supply to the motor
- ✓ Use a single cable from control panel right up to submersible 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

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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

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### Direct online starter

Cable	Terminal
Red	U
Yellow	V
Blue	W

### Star delta starter

Cable 1	Terminal 1	Terminal 2
Red	U1	U2
Yellow	V1	V2
Blue	W1	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

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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 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.

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

## Earthing

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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

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Caution

Observe relevant electricity board regulations while powering up the pump set



Warning

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

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Warning

When installing the pump, be mindful of the pump's centre of gravity and weight. If the pump is not suspended properly, the pump may fall and break, which may lead to injury



Caution

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

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



Handle the pump carefully. Do not subject the pump to shock loads, such as by dropping it.



Caution

The rope for suspending the pump during its installation must be of thickness that accommodates the weight of the pump. When using a chain, make sure that the chain does not become twisted. Failure to observe these precautions could cause the rope / chain to break and the pump to fall and break, leading to injury.



Operate the pump in a location that has sufficient water level and collects water easily.



Caution

If the end of the hose is submerged in water, it may cause water to flow back when the pump is stopped. Conversely if the end of the hose is located at a level that is lower than the source water level, water may flow even after the pump has been stopped.



If a hose is used, route it as straight as possible. Excessive bending of hose could obstruct flow of water, reduce pumping volume, or clog the pump with sludge, thus disabling the pumping function



Operate the pump upright. If there is likelihood of the pump drawing in excess mud / sludge, raise the pump by placing a concrete block under the pump



Caution

If the pump draws in large amounts of mud, it could cause pump to wear prematurely and lead to malfunction, current leakage, and electrical shock.

## Start-up

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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.
	ELCB has tripped out	Reset the ELCB, If trips again check the insulation resistance of the motor.
The starter is defective	Check the starter and replace if necessary	

<b>Fault</b>	<b>Possible causes</b>	<b>Suggested actions</b>
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	For three phase, Interchange the supply connections of any two phases
	Increase in draw-down	Lower the pumpset or wait for water level to rise
	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 deposits	Clean the pipe and remove deposits
	Foreign bodies lodged in impellers	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 valve 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
Total head developed is too low	Pump and the riser pipe are partly choked by impurities	Pull out the pump. Check and clean or replace pump if necessary. Clean pipes
	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

<b>Fault</b>	<b>Possible causes</b>	<b>Suggested actions</b>
Current consumption in excess	Single phasing	Check line fuses / availability of three-phase supply
	Voltage too low	Check voltage
	Defective rotor	Change rotor
	Defective motor winding	Change winding
	Damaged 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 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

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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. 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

Utilise the services of certified electrician to carry out electrical measurements / checking the functioning of control panel



Taro Submersible pumps do not require regular 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 checking 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 works.

## Maintenance precaution



Warning

Disconnect 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 control panel 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
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

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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 shock
- ✓ During unpacking and prior to installation, care must be taken when handling the pump to ensure that misalignment does not occur due to bending
- ✓ If the product has been stored for a very long period, check the condition of the rubber gaskets, free rotation of the shaft, and level of water inside the motor



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 rotating parts before use



Caution

After a long period of storage, the pump should be inspected before it is put in operation. Ensure impeller 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

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For most up to date information on Texmo Industries, please visit [www.taropumps.com](http://www.taropumps.com)





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