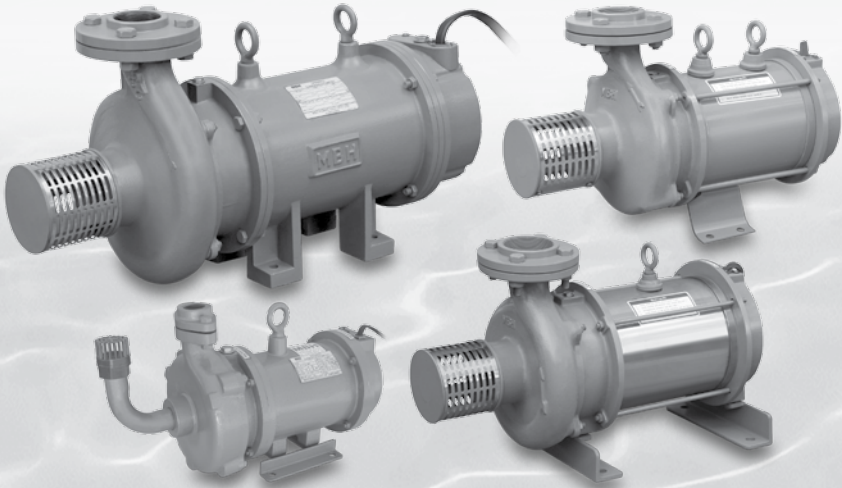


# MBH<sup>®</sup> PUMPS

Instruction, Installation, Operation  
and Maintenance Manual

## OPEN WELL HORIZONTAL SUBMERSIBLE PUMPS



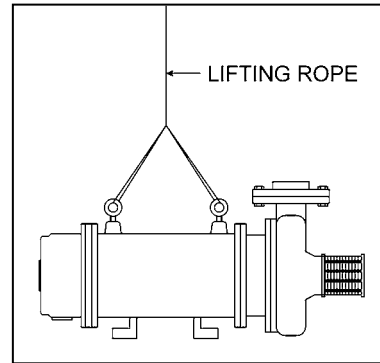
ISO 9001  
Certified Company



*A Mark of Quality*

## 1. HANDLING

When the entire pump is to be lifted in vertical direction, then it is recommended to lift the pump at the Lifting bolt by means of straps/ropes as shown in figure 1.1. If pump is to be moved from one place to another place then it is recommended to lift the pump at mounting casing by means of hand.



## 2. FEATURES

- Designed for underwater applications - No need of priming and foot valve.
- Easy installation - Foundation and installation platform or pump house not required.
- Designed to prevent overloading and motor burning.
- Dynamically balanced rotating parts to ensure minimum vibrations during running.
- Replaceable wearing parts and hence longer life.
- Easy maintenance and spares availability.

### Applications :

- Submerged pump in Fountains, Wells, Sumps and Water tanks.
- Water supply for domestic use in high rise Apartments, Buildings and Hotels.
- Gardening and sprinklers/conventional irrigation.
- Industries, for clear water handling.

## 3. OPERATING CONDITIONS

### 3.1 Pumped Liquids :

Pumps are suitable only to pump thin, non-explosive liquids, not containing solid particles. The liquid must not attack the pump materials chemically. When pumping liquids with density and/or viscosity higher than that of water, suitability of motor winding with correspondingly higher outputs must be checked, if required.

### 3.2 Submerged Condition :

The pump must be submerged in water more than 1 meter.

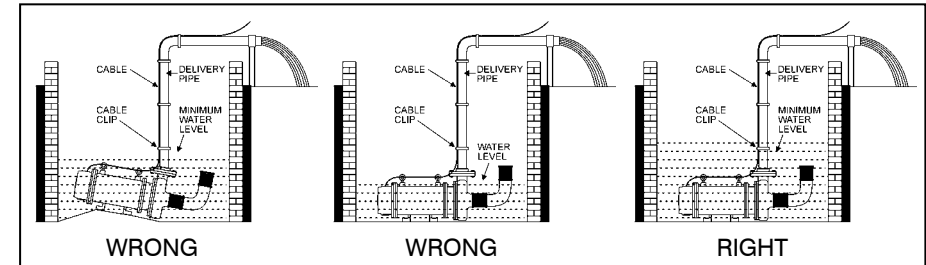
## 4. INSTALLATION

### 4.1 Guidelines :

For avoiding the un-necessary troubles in Installation, Operation Maintenance and for Utmost Performance of the Pump, we are suggesting few guidelines. We hope by following these guidelines our customer will be able to install the pump easily and operate the pump at optimum performance.

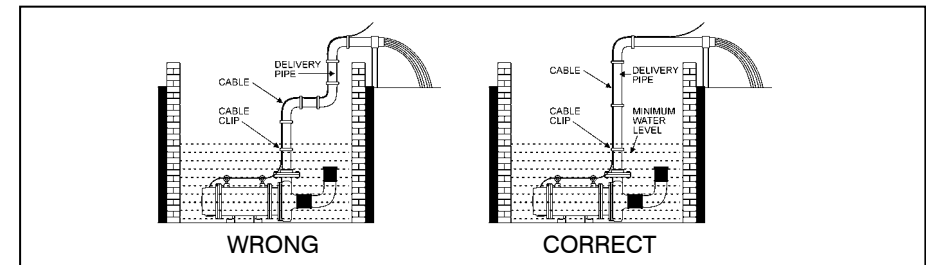
### 4.2 Guideline for Installation :

**4.2.1 Location :** The pump should be installed in horizontal position and submerged in the water more than 1 meter. This will eliminate dry run and pump will give better performance. The pump does not require any foundation; however if installing dug cum bore well, surface should be plain. The pump should not be installed in tilted position.



### 4.2.2 Guideline for Piping :

- Pipe size should be as per flange size to get higher discharge. It is not recommended to reduce pipe size. If length of delivery pipe is more than 3 m., use higher pipe.
- The piping should be airtight. Any leakage in pipe may drastically affect the performance of the pump.
- The suction pipe should be as short as possible for getting better discharge. (in case of dug cum bore well type arrangement.)
- No. of bends and other fittings should be as minimum as possible to reduce frictional losses.
- Adequate supports should be provided to pipes so that its dead weight should not fall on delivery casing completely.



- For delivery pressure more than 20 meters, it is recommended to install a check (non-return) valve in the discharge line. The check valve placed near the pump is to protect the pump from excessive back pressure to prevent the water running back through the pump in case of sudden failure of prime mover.
- Nuts at terminal should be tightened properly.
- No. of joints in cable should be less as possible, preferably joints should be avoided.
- Wires and connections should be properly insulated. If not it may lead to fatal shock.
- Proper backup protection (reputed make starter, main switch and fuse) should be used.

## 5. GUIDELINE FOR STARTING THE PUMP

### 5.1 Check following before starting the pump :

- The shaft rotates freely by hand.
- Electrical connection is proper as per above mentioned diagram.
- The motor is filled with clear cold water by opening both the lifting bolts. The water should be filled through one hole till the water comes out of the other.
- Usage of bend at suction.
- Remove Suction and Delivery Rubber Packing before Installation.

### 5.2 Check following during running condition :

- The direction of rotation is correct.
- The pump is running smoothly.
- See that the prime mover is not overloaded .
- Avoid idle running on operation against closed discharge valve for a longer period of time.

## 6. MAINTENANCE :

### 6.1 When the pump will not be used for a long time :

- When pump is kept unused for a long time, switch off the power. Drain water in the pump and tank to avoid damages, i.e. risk of water freezing. Unscrew drainage screw. Protect water supply pipe and accessories from frost : insulate them or store them inside.
- There is a possibility for the motor not to start in spite of switching on the power because of the sticking and solidification of the dirty particle in the pump head. In that case, it requires some service before usage. Switch off the power, then rotate the stiff shaft at the back of the motor with a screwdriver to make it easy, safety and reliable for its operation as usual.


### 6.2 Recommended spares for two years of normal working

1. Impeller
2. Bush bearings
3. Capacitors (In case of single phase pump)
4. Paper packing
5. Oil seal
6. Teflon coated plate

### 6.3 Check the following periodically (six monthly)

1. Impeller wear out
2. Oil seal wear out
3. Bearing bush wear out
4. Pipe connections
5. Strainer chocking

## 7. TROUBLE SHOOTING CHART

Types of Failure	Failure to deliver water	Pump does not deliver rated discharge	Pump does not deliver rated head	Pump loses water after atsr	Pump over loads prime mover	Vibration	Bearing wear rapidly	Seized pump	Irregular delivery
									
Wrong direction of rotation	•	•	•						
Inlet insufficiently submerged	•	•		•		•			
Pump not upto rated speed	•	•	•						
Viscosity/specific gravity greater than rated		•	•		•				
Impeller blocked or damaged		•	•			•			
Internal leakage		•	•						
Gas or vapour in liquid				•	•				•
Speed to high					•				
Total head lower than recommended					•				
Worn or loose thrust plate					•				•
Rotor out of balance						•			
Bent shaft						•	•		
Thrust plate rubbing on bush					•	•	•		
Excessive thrust							•		
Lack of lubrication							•		
Pump does not deliver rated capacity	•		•					•	
Pipes exert forces on pump					•	•	•	•	
Foreign matters in pump								•	
Viscosity lower than rated	•	•							
Speed to low	•	•	•						
Lead in delivery pipe work	•	•			•				

## 8. CAUSE & REMEDY CHART

(In case of any problem, please check the underlined instructions)

### 1. PUMP DOES NOT WORK

No.	CAUSES	HOW TO CHECK	REMEDIES
1	No power in main control panel/ capacitor box	Check for blown out fuses in main.	Replace blown out fuses. If new fuse also blows out recheck all electrical wiring and earthing. Check fuse wire size against actual requirement.
		Check for tripped circuit breakers.	Check the wiring to capacitor box/starter. If the circuit breakers trips again, recheck all electrical wiring including earthing.
2	Defective capacitor box/starter or incorrect wiring.	Check the wiring, connection, voltage, relay and coil size of the starter.	Rectify or replace defective parts of capacitor box starter. Reconnect the capacitor box/starter correctly. Change the relay and coil size of the capacitor box/starter for actual requirement.
3	Faulty pressure switch & other control devices for defects.	Check pressure switch & other control devices for defects.	Repair or replace faulty pressure switch or control devices.
4	Pump has been stored unfavorable condition for a long time before installation or defective submersible motor or cable.	Switch off the main power line, de-link pump power leads from capacitor box/starter. Check the motor winding insulation resistance with the help of a megger to see whether the insulation resistance reading is at least 20m. ohm and check for defective cable.	When megger reading shows less than 20m. ohm remove the pumpset and cable and recheck values on the ground. Repair or replace motor and/or cable.
5	Defective capacitor (for single phase pumpset).	Switch off the main power line. Discharge the capacitor and check the condition.	Replace the capacitor if required.
6	Pump choked.	Remove the pump from the well. Ensure whether the pump rotates freely and the pump is free from excessive sand, silt & mud.	If the pump portion is damaged, repair or replace the parts. In case of repairing, make sure that the pump is rinsed with water before installation.
7	Rotor seized due to prolonged shut down of pumpset.	Remove the pump from the well ensure that the motor shaft rotates freely.	Repair or replace the rotor.

## CAUSE & REMEDY CHART

(In case of any problem, please check the underlined instructions)

### 2. PUMP DELIVERS INSUFFICIENT WATER OR VERY LOW TOTAL HEAD

No.	CAUSES	HOW TO CHECK	REMEDIES
1	Well water yield reduced.	Check draw down water level. Ensure that the pump is always submerged in water during operation.	If possible lower the pumpset, adjust the gate valve of the riser pipe to match the yield of the bore well install dry run reventor.
2	Leak in riser pipe and / or surface pipe and / or valves.	Check for leakage.	Remove the leakages.
3	Water inlet strainer to the pump partially blocked.	Remove the pump and inspect.	Clean the strainer, if damaged replace it.
4	Worn out impeller, bushes, thrust assembly.	Remove the pump from the well, ensure that the water is free from excessive sand silt and mud.	Repair or replace pump parts.
5	Wrong direction of rotation (three phase)	Refer electrical Drawing.	Interchange any two phase or the power line connections.
6	Partially closed gate valve/check valve.	Inspect the gate valve / check valve.	Open the valve fully, if stuck free the valve.
7	Low Voltage.	When the pump operates, check the voltage at capacitor box/starter. Check power cable size and drop cable size.	When cable size are found inadequate change cable and replace to adequate size.
8	Riser pipe inner passage coated with deposits from water. Clogged impeller.	Remove the pump and inspect the water inlet strainer and impeller.	Clean or replace the pipes. Dismantle and clean the impellers or replace the pump parts. Clean or replace the damaged strainer.
9	Smaller size riser pipe is used.	Excessive head loss due to smaller dia pipe.	Change with adequate capacity pipes.

## CAUSE & REMEDY CHART

(In case of any problem, please check the underlined instructions)

### 3. TRIPPING OF CIRCUIT BREAKERS OVER LOAD PROTECTORS OR FUSES BLOWN UP DURING OPERATION OF PUMP

No.	CAUSES	HOW TO CHECK	REMEDIES
1	Low or high voltage.	Check voltage at starter/capacitor box whether it is with in 10%. Check power cable and drop cable size.	When cable size are found inadequate change cable and replaces to adequate size.
2	Defective capacitor box/starter or incorrect wiring.	Check the wiring, connection, voltage, relay and coil size of the starter.	Rectify or replace defective parts of capacitor box/starter. Reconnect the capacitor box/starter correctly. Change the relay and coil size of the capacitor box/starter for actual requirement.
3	Defective capacitor (for single phase pumpset).	Switch off the main power line. Discharge the capacitor and check the condition.	Replace the capacitor if required.
4	Power line cable shorted, earthed or cable insulation damaged.	Switch off the main power line and inspect.	If required change the cable.

### 4. PUMP STARTS VERY OFTEN

No.	CAUSES	HOW TO CHECK	REMEDIES
1	Improper setting of pressure switch or defective pressure switch.	Check the pressure switch setting and examine defect in the switch.	Adjust and reset the pressure switch or replace the switch if defective.
2	Leakage in the system.	Check all pipes, valves, tank and all plumbings for leaks.	Arrest leakage or replace component wherever necessary.
3	Water level monitor is not properly set or defective.	Check the water level monitor setting and inspect for defects.	Adjust and reset the water level, replace monitor if defective.
4	Inadequate size of tank.	Check tank size against consumption and pump discharge capacity.	Change to an adequate sized tank.

## CAUSE & REMEDY CHART

(In case of any problem, please check the underlined instructions)

### 5. ABSORBED POWER / CURRENT IS EXCESSIVE

No.	CAUSES	HOW TO CHECK	REMEDIES
1	Defective fuse or single phasing.	Check for blown out fuses.	Replace blown out fuses. If new fuses also blows out recheck all electrical wiring and earthing. Check fuse wire size against actual requirement.
2	Abrasive wear of pump bushes and thrust assembly.	Check for higher sand content, solids & mud.	Remove the pumpset from the well and inspect. Replace the worn out pump bushes and thrust assembly.
3	Well water yield reduced.	Check draw down water level and ensure that the pumpset is always submerged in water during operation.	If possible lower the pumpset adjust the gate valve of the riser pipe to match the yield of the bore well install dry run prevent.
4	Low voltage.	When the pump operates, check the voltage at capacitor box/starter. Check power cable size and drop cable size.	When cable size are found inadequate change cable and replace to adequate size.
5	High voltage/high frequency. Resulting in high motor speed.	Check the voltage frequency at capacitor box/starter.	Use an appropriate voltage stabilizer.
6	Cable defective.	Check the cable for damage.	When cable size are found inadequate change cable and replace to adequate size.
7	Loose connections.	Check for loose connections, as loose connection will drop more voltage results as low voltage.	Check the joints and connections, connect the joints permanently. Avoid excessive joints.
8	Improper selection of pumpset.	Verify the pumpset data with field conditions.	If the pump selection is wrong select the suitable pump.

## CAUSE & REMEDY CHART

(In case of any problem, please check the underlined instructions)

### 6. PUMP RUNS ROUGHLY AND NOISY / EXCESSIVE VIBRATION

No.	CAUSES	HOW TO CHECK	REMEDIES
1	Abrasive wear of pump bushes and thrust assembly.	Check for higher sand content, solids & mud.	Remove the pumpset from the well and inspect. Replace the worn out pump bushes and thrust assembly.
2	Clogged impeller / strainer.	Remove the pump and inspect the water inlet strainer and impeller.	Dismantle and clean the impellers or replace the pump parts. Clean or replace the damaged strainer.
3	Mechanical friction.	Due to dry running of pump and failure of thrust assembly.	Remove the pumpset from the well and inspect. Replace the worn out pump parts.
4	Water level of well is insufficient.	Check draw down water level and ensure that the pump is always submerged in water during operation.	When the yield of well not matches with the pumps discharge, fit one gate valve in delivery pipe and throttle according to the yield. Install a dry run Preventer.
5	Vibration of delivery pipe.	Check whether the valves are properly functioning or not.	Change the defective check valve or gate valve. Provide proper supports to the delivery pipe.



## 9. DISMANTLING PROCEDURE

- Remove the suction housing and delivery pipe.
- Unscrew the nut and remove the suction and delivery flange.
- Unscrew the nut and remove the delivery casing from the mounting casing.
- Unscrew the nylon nut and remove washer and impeller from shaft.
- Remove oil seal from mounting casing.
- Unscrew the nut from tie rod and remove mounting casing from motor body.
- Unscrew the cable plug and remove cable grommet.
- Remove cover NDE. Please ensure that cable does not get damaged.
- Remove the shaft along with the rotor.

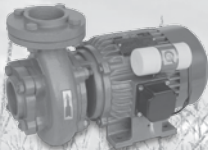
## 10. DISPOSAL

Our products are meant for pumping water and they do not have any significant effect on environment during their use. If properly selected and used as per instructions given in the manual. Customers are advised to dispose off unusable components through government or private disposal waste collection to avoid the harmful impact (if any) on the environment.

### CAPACITOR DETAIL FOR SINGLE PHASE OPENWELL SUBMERSIBLE PUMP

H.P.	RUNNING CAPACITOR
0.5	36 MFD
1.0	45 MFD
1.5	45 MFD
2.0	36+36 MFD
3.0	50+50 MFD

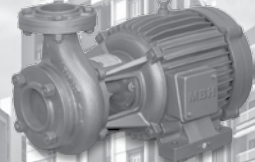
# OTHER PRODUCTS



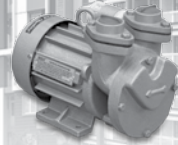
**Single Phase Centrifugal  
Monoblock Pumpset**



**3" to 12" Submersible Pumps**



**Three Phase Centrifugal  
Monoblock Pumpset**



**Self Priming Pumps (Single Phase)**

*Specifications and performance are subject to change without prior notice.*



**ISO 9001**  
*Certified Company*

# **MBH<sup>®</sup>** **PUMPS**

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