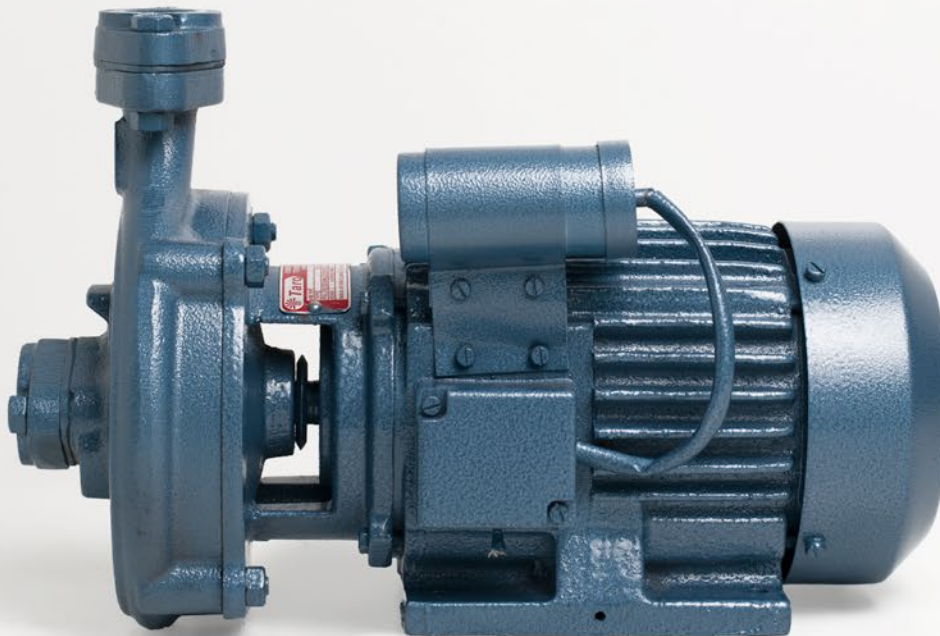


# Single Phase Capacitor Start and Run High Speed Centrifugal Monoblocks

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 with standards

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- IS 996: Single phase AC Induction motors for general purpose
- IS 3043: Code of practice for earthing: specification
- IS 9079: Specifications for electrical monoset pumps for clear, cold water: for agricultural and water supply purposes
- IS13730: Specifications for particular types of winding wires

## 4. Contents of the packing box

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Based on the model you have purchased, your Single Phase Capacitor Start and Run High Speed Monoblock is packed along with an 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 Single Phase Capacitor Start and Run High Speed Monoblocks are manufactured using high quality raw materials and components using state-of-the-art manufacturing facilities and will give trouble free performance if properly installed and maintained. These monoblocks are compact pumping systems with the pump and motor mounted on a common shaft. As a coupling is not required, alignment of the pump and motor is assured. Installation therefore is quick. Monoblocks find wide application for irrigation of farms, domestic water supply, cooling water circulating systems, fountains, dairies, water supply to high rise buildings, housing complexes, bungalows, cattle and poultry farms.

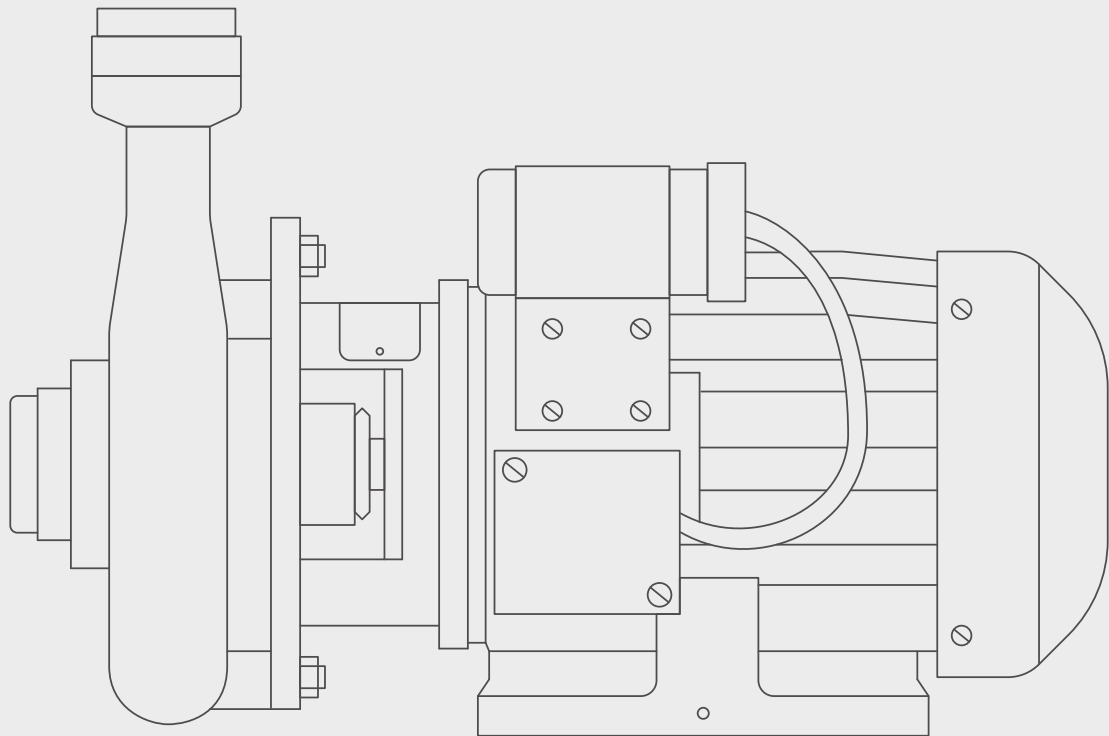
Prior to installation, read this manual carefully and follow the instructions for installation and maintenance of our monoblock so as to ensure reliable operation. The monoblock should be installed by technically qualified personnel in compliance with national and local electrical codes and as per our instructions in order to avoid electrical shocks, unsatisfactory performance and equipment failure.

## 6. Schematic drawing

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View of a Single Phase Monoblock is shown below in Fig. 1:

**Fig. 1 View of Single Phase Monoblock**



## 7. Key specifications & features

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Standard specifications of Monoblock are shown below in TABLE 1:

Phase	Single
Power	0.5 - 5.0 HP
Motor Type	Squirrel Cage Induction Motor – Capacitor Start Run
Starting method	DOL
Operating Voltage	180 – 240V
Frequency	50 Hz
Speed	2900 rpm
Duty	S1 Continuous
Insulation Class	Refer name Plate
Type of Enclosure	TEFC
Impeller Type	Radial
Max. Fluid Temperature	33°C
Thermal Overload Protection (TOP)	Provided for monoblocks rated .2 HP and below

### Product performance specification

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Texmo Industries has a wide variety of Single Phase Monoblocks to meet your requirements. Please consult our Sales team / your nearest dealer to meet your specific requirements.

## Key features

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- ✓ Low watt loss stampings used in motors
- ✓ Designed for wide voltage operation
- ✓ Motors are capacitor start and run type
- ✓ The motor houses shielded type deep groove ball bearings, pre-filled with grease, to take up the radial and axial thrust loads
- ✓ The rotors are dynamically balanced
- ✓ Adequate motor surface area is provided for effective cooling
- ✓ Automated Machine winding process ensures consistent quality
- ✓ To protect the motor from overload, Thermal Overload Protector (TOP) is provided
- ✓ The impeller is dynamically balanced for longer life
- ✓ Water slinger provided to prevent water entry into the front bearing
- ✓ To reduce friction, the stuffing box - gland-assembly is replaced with a mechanical seal

## Electrical Connection

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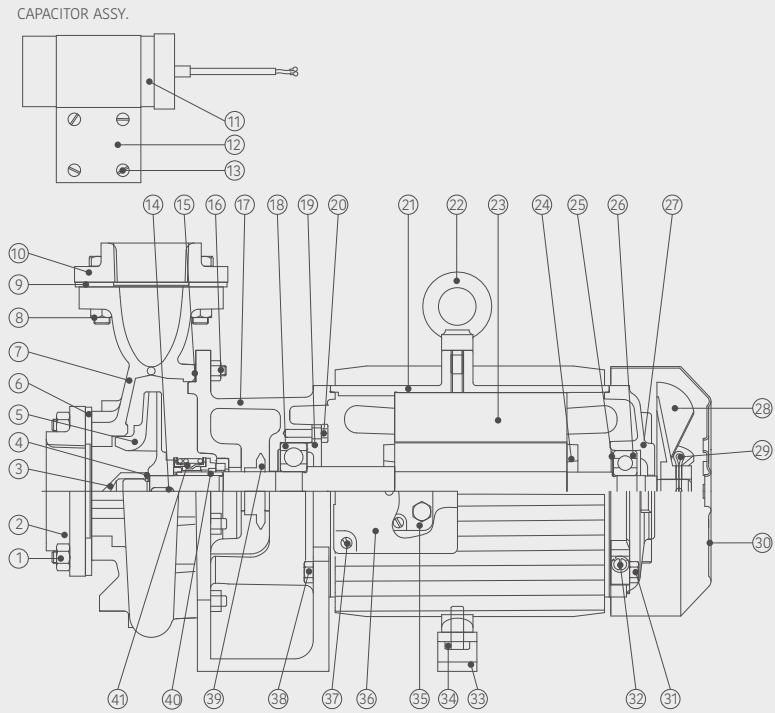
- ✓ The motors are internally wired and pre-connected with the capacitor leads
- ✓ Only phase and neutral to be connected to the two wires emerging out from the terminal box cover



# 8. Cross-section view

Cross-section view of Single Phase Capacitor Start and Run High Speed Monoblock is shown below in Fig. 2:

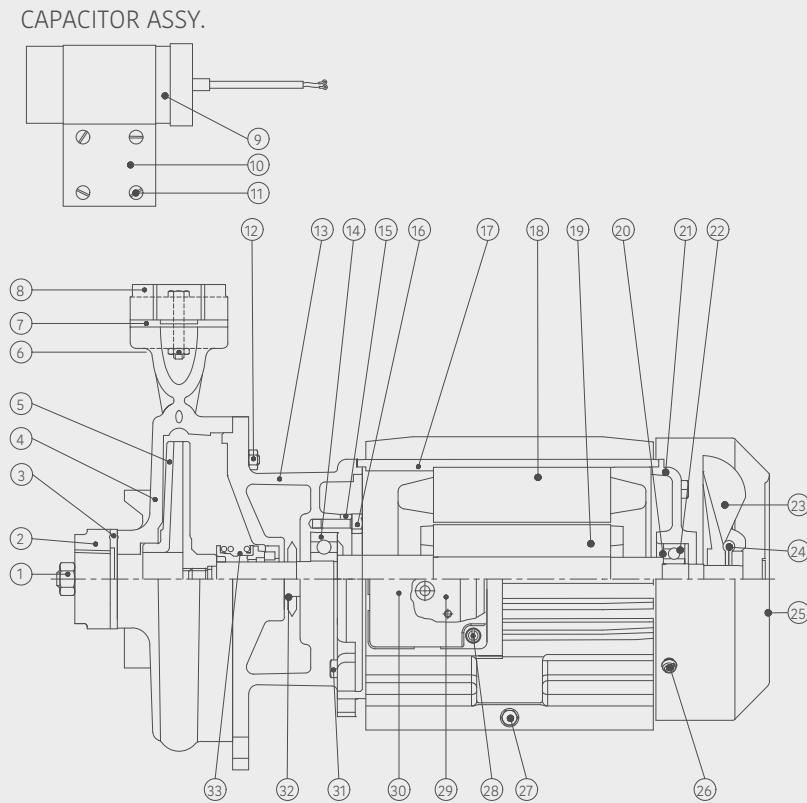
**Fig. 2 Cross-section view of single phase capacitor start and run high speed monoblock – cover dome mounting**



No.	PART NAME	No.	PART NAME	No.	PART NAME
1	Stud With Hex.Nut	15	Bearing Cap - Front Inner	28	C.H Screw
2	Flange	16	Hex. Bolt	29	Terminal Board
3	Gasket	17	Motor Body	30	Terminal Box Cover
4	Casing	18	Stator Stack	31	Hex. Head Bolt
5	Impeller	19	Rotor With Shaft	32	Slinger
6	Hex. Bolt With Nut	20	Bearing Shield	33	Mechanical Seal
7	Gasket	21	Rear Cover	34	Hex. Head Bolt
8	Flange	22	Ball Bearing - Double Shield	35	Terminal Board
9	Capacitor	23	Cooling Fan	36	Terminal Box Cover
10	Capacitor Clamp	24	Split Cotter Pin	37	C.H Screw
11	C.H Screw	25	Fan Shield	38	Hex. Head Bolt
12	Stud With Nut	26	C.H Screw + Spring Washer	39	Slinger
13	Cover Dome	27	Hex. Head Bolt With Washer	40	Sleeve
14	Ball Bearing - Double Shield			41	Mechanical Seal

Cross-section view of Single Phase Capacitor Start and Run High Speed Monoblock is shown below in Fig. 3:

**Fig. 3 Cross-section view of single phase capacitor start and run high speed monoblock – motor body mounting**



No.	PART NAME	No.	PART NAME	No.	PART NAME
1	Stud With Hex.Nut	13	Cover Dome	23	Cooling Fan
2	Flange	14	Ball Bearing - Double Shield	24	Split Cotter Pin
3	Gasket	15	Bearing Cap - Front Inner	25	Fan Shield
4	Casing	16	Hex. Bolt	26	C.H Screw + Spring Washer
5	Impeller	17	Motor Body	27	Hex. Head Bolt With Washer
6	Hex. Bolt With Nut	18	Stator Stack	28	C.H Screw
7	Gasket	19	Rotor With Shaft	29	Terminal Board
8	Flange	20	Bearing Shield	30	Terminal Box Cover
9	Capacitor	21	Rear Cover	31	Hex. Head Bolt
10	Capacitor Clamp	22	Ball Bearing - Double Shield	32	Slinger
11	C.H Screw			33	Mechanical Seal
12	Stud With Nut				

# 9. Pre-installation requirements

## Arrangement for Installation

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- ✓ Use the services of a professional and trained mechanic with experience in erecting monoblocks
- ✓ Ensure proper safety during installation
- ✓ Ensure that a level foundation is ready before erection of the monoblock. Contact the dealer from whom the monoblock was purchased for the motor mounting details for preparing the foundation.

## General installation precautions

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- ✓ Open the packaging and note down the serial number and model for future reference
- ✓ Ensure all fasteners are tightened properly
- ✓ Use prescribed pipe sizes as mentioned on the product name plate
- ✓ Use a quality foot valve with strainer
- ✓ After installation, prime the set before starting the pump
- ✓ Do not install the monoblock with high static suction lift
- ✓ It is recommended to install the monoblock on a level base with foundation bolts to prevent the pump and piping from getting stressed
- ✓ Use an check valve fitted on the delivery line when the monoblock has high delivery heads
- ✓ As the monoblock is air cooled, ensure that air flow to the cooling fan, located at the rear side of the motor, is not blocked
- ✓ Use a single power cable from the power source to the monoblock. Do not use a power cable with large number of joints as this can result in a significant voltage drop
- ✓ While installing the monoblock, ensure the monoblock is not subject to shock loads which can damage the monoblock parts

 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, toxic, corrosive and flammable liquids. Pumping flammable liquids could cause explosion
 Caution	Ensure suitable precautions are taken while lifting and lowering the product
 Caution	Use trained professionals to install the monoblock
 Warning	Use a power supply cable that has sufficient rating. Factor in low voltage operation
 Warning	Provide proper earthing. Improper earthing can cause electrical shock
 Caution	Use a megger to verify the insulation resistance of the motor. Insulation resistance should be 20MΩ minimum
 Caution	Do not place the monoblock in a location subject to flooding as water can enter the motor and damage the windings and bearings
 Warning	Mount the pump with its axis horizontal

## Operation Precautions

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Caution

The volute casing houses a mechanical seal. Do not attempt to run the pump dry as the Mechanical Seal can get damaged during dry operation. Ensure the pump is primed and then run it

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Warning

Switch OFF the power before working on electrical lines

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Caution

Do not use this pump for pumping liquid exceeding 33°C as this may lead to product failure

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Warning

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



# 10. Installation procedure

Please follow the below procedure to install the monoblock.



Caution

The supply voltage should be within the specified voltage range.  
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 and may lead to current leakage or electrical shock



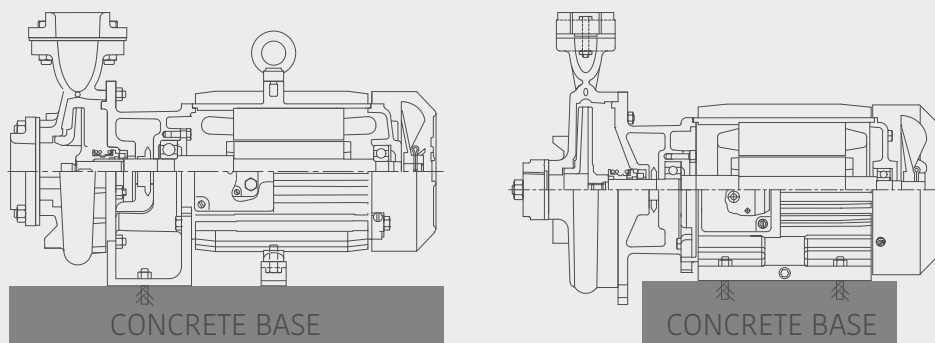
Warning

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

## Installation

The following steps are executed prior to installation

- ✓ Measure the insulation resistance using a megger of 500 VDC
- ✓ Ensure contact points are clean
- ✓ Connect the measuring cable to the ground conductor
- ✓ Connect the other measuring cable to phase terminal
- ✓ Ensure that the insulation resistance, as shown on the megger, is a minimum of 20MΩ
- ✓ Prepare a level concrete foundation for mounting the monoblock and tighten the motor base using the foundation bolts as shown in Fig. 4 below:



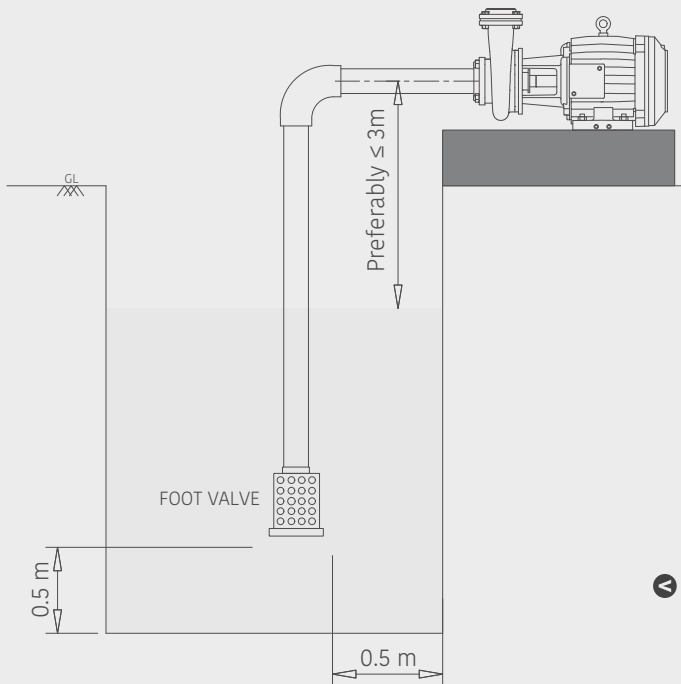
**Fig. 4 Monoblock on a concrete foundation - installation**



Use prescribed pipe sizes as mentioned on the product name plate



Place the pump centre line as close as possible to the water surface and with the foot valve fixed above the bottom of the well. Refer Fig. 5, shown below, for recommendations:



**Fig. 5 Recommendations for locating the pump and foot valve**



Use as few pipe fittings as possible in the suction line

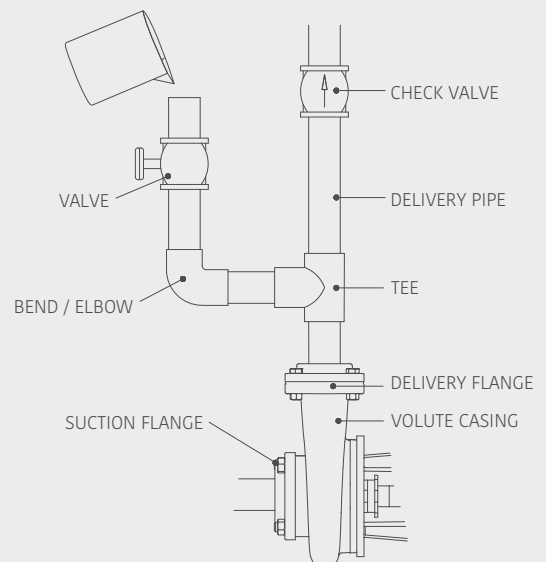


Use a good quality foot valve to reduce suction losses



Provide a priming facility in the pipe line adjacent to the pump discharge flange as shown in Fig. 6 below:

**Fig. 6 Priming arrangement for monoblocks**

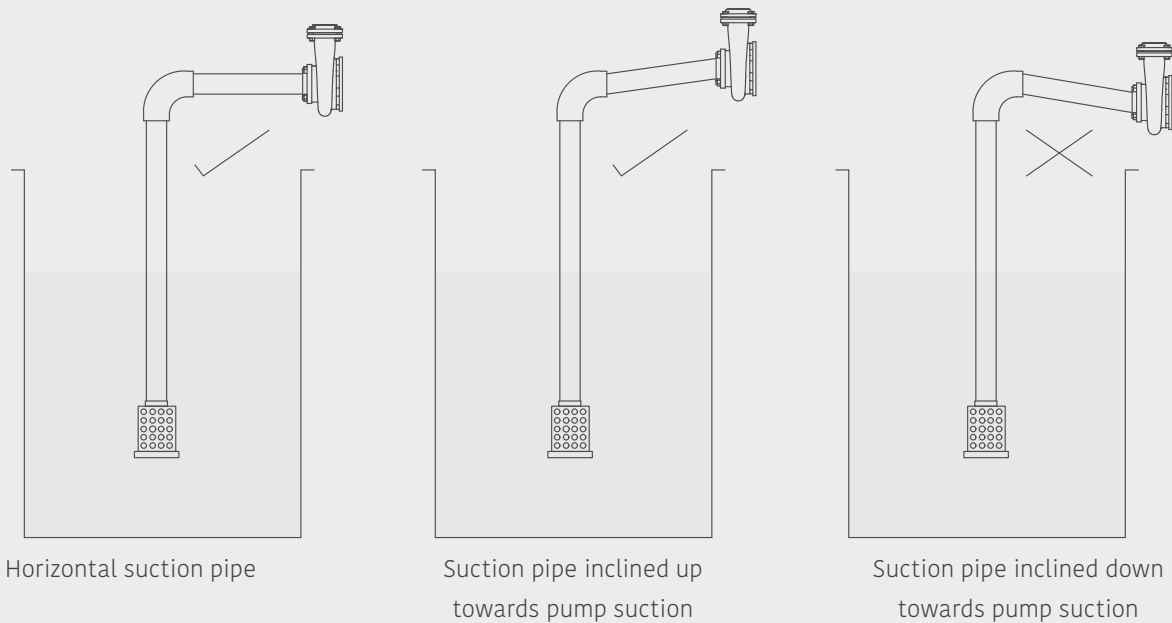




During priming, check the pump suction pipe for leakages



Ensure that the suction pipe connected to the pump suction flange is horizontal or sloping upwards towards the pump suction flange to prevent air lock. A pipe sloping downwards towards the pump suction flange will result in air lock. Refer Fig. 7, shown below, for the preferred suction pipe orientation.



**▲ Fig. 7 Preferred orientation of suction pipe for monoblocks**



In case the installation has a high static delivery head, mount a good quality check valve in the delivery line as close as possible to the pump delivery flange

## Electrical Installation



Check the 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



As far as possible, do not use multiple joints in the electrical cabling while connecting the starter to the monoblock



Ground the monoblock using the earth screws provided on the leg of the motor body / on the motor body



Ensure electrical joints, if any, are properly and adequately insulated



Connect the cable properly to an MCB



Factor in low voltage operation while selecting cable size

## 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

## 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 cause 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 pumpset



Warning

Before 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

## Power cable connection to monoblock

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The motors are internally wired and pre-connected with the capacitor leads with two leads emerging out from the Terminal Box Cover



Only Phase and Neutral need to be connected to these two leads



In case of clarification, please refer to the Connection Diagram displayed in the inner side of the Terminal Box Cover

## Checking direction of rotation of Single phase monoblock

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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 and internal wiring codes.



Ensure pump is primed



Power up the monoblock and check the direction of rotation of the motor shaft



If the direction of rotation is in the same direction as that marked on the volute casing, the connections are right



In case the direction of rotation of the motor shaft does not match the marking on the volute casing, bring this to the notice of the dealer from whom the purchase was made and get the set repaired



# 11. Basic troubleshooting



Warning

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

Read this Operation manual carefully before requesting repair. Contact the dealer where 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 2 below:

<b>Fault</b>	<b>Possible causes</b>	<b>Suggested actions</b>
Pump does not run	No power supply	Check incoming power supply and rectify
	Very low voltage	Operate in the recommended voltage range
	Impeller stuck	Remove the fan cover and rotate fan by hand
	Defective Capacitor	Replace Capacitor
	Loose connections	Check the connections
	Fuse blown	Replace fuse
Pump does not discharge water	Motor tripping by T.O.P	Allow the motor to cool
	Pump has been kept for long time	Ensure free rotation of shaft by running the pump idle for a few minutes at least every alternate day
	Air leakage on the suction side	Check and correct for leakages
	Suction lift too high	Reduce the suction lift
	Foot valve not sufficiently submerged	Lower the foot valve and ensure that the foot valve is submerged at least 1 metre below the free surface of water
	Check valve is jammed	Check and replace
	Motor coil burnt	Rewind the motor
Low voltage operation	Operate in the recommended voltage range	

<b>Fault</b>	<b>Possible causes</b>	<b>Suggested actions</b>
Less discharge from pump	Low voltage operation	Operate in the recommended voltage range
	Wrong direction of rotation	Repair in the nearest authorised service center
	Static suction lift high	Position the pump within recommended suction lift
	Total head higher than specified head	Ensure delivery head within specified value
	Leaky pipes	Check the piping system and rectify the faults
	Smaller pipe size used when compared to name plate recommendations	Use recommended size of pipes
	Discharge pipe internally coated with depositions	Clean the pipe
	Foreign bodies lodged in impellers	Check the impellers and remove the foreign bodies
	The valve in the discharge pipe is partly closed / blocked	Check and clean / replace the valves, if necessary
	The Check valve of the pump is partly blocked.	Check and clean Check valve. Replace if necessary
	Impeller is worn out	Check and replace
Excessive current / Fuse blows off frequently	Low voltage	Check the voltage
	Gate valve is partially closed	Check and open the delivery side valve fully
	Defective fuse	Check and replace / rectify the fuse
	Defective motor winding	Change the winding
	Bearing worn-out	Replace bearings
	Decreased system head	Throttle the discharge slightly
	Excessive wear and tear due to rubbing of parts	Service the pump replacing the worn out parts

<b>Fault</b>	<b>Possible causes</b>	<b>Suggested actions</b>
Pump runs rough and noisy	Bearings worn out	Dismantle and replace worn out bearings
	Pump cavitating due to high suction lift	Reduce static suction lift
	Pump not grouted	Grout the pump
	Rotor shaft is bent resulting in rotor rubbing against stator bore	Replace rotor shaft
	Excessive wear and tear	Check impeller if required replace the impeller. Check rotor run out at location of impeller. If excessive, replace rotor
Pump leaks excessively	Mechanical seal damaged	Replace mechanical seal
	Pipe line damaged	Check and replace piping



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 monoblock as it may lead to severe damage to the pump or injury to personnel. Contact the dealer where this pump was purchased







# 12. Preventive maintenance checks

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## Precautions to be taken



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.

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



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 an electrician to carry out electrical measurements / checking the functioning of the control panel



It is good practice to monitor the conditions and performance of the monoblock. Diagnosis may be carried out by checking the following:

- ✓ Close the delivery valve for a few seconds and check the shut-off head generated by the pump.  
Do not run at shut-off conditions for a prolonged period of time as the water in the volute casing will get hot
- ✓ 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
- ✓ Measure the insulation resistance of the winding to check the condition of the motor
- ✓ Check for leakage from the mechanical seal location
- ✓ Check the capacitance of the capacitor

## 13. Do's and don'ts

Do's	Don'ts
Use a quality foot valve	Do not install the pump with high static suction lift
Ensure leak proof joints on the suction side to prevent air entry and therefore loss of priming	Do not use piping smaller than what is mentioned on the name plate
Use as few joints as possible on the suction line	Provide sufficient space around the monoblock so as to ensure proper airflow
After installation, prime the pump	Restrict the number of joints on the cable. More the cable joints, more will be the voltage drop
Rotate the shaft to ensure that pump is not jammed	Do not place the foot valve right near the bottom of the well / tank / river as there is possibility for solids to be entrained with water
Ensure proper earthing is provided	Do not restrict the space behind the cooling cover as this will obstruct the flow of air required for cooling of the motor
Mount the monoblock on a level foundation	Do not use to pump corrosive and flammable liquids
Check the direction of rotation of the monoblock matches the arrow mark cast on the volute casing	Do not earth to a water line or gas line
Rubber gaskets assembled on the suction and delivery casing do not have a central hole. Cut out the central hole and re-install	Do not use undersized electric cables between Pump and Starter Panel. Factor in low voltage usage
Check all fasteners are tight	Do not cover the product as this will prevent effective cooling of the motor
Motor portion of monoblock is IP44 protected. Provide protection from rain	Do not keep the pump suction tapering down towards the pump suction to prevent air lock

# 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



The Single Phase capacitor start and run high speed monoblocks are supplied from the factory in proper packing in which they should remain until they are to be installed



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



Do not store the products in direct sunlight



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



During unpacking and prior to installation, care must be taken when handling the pump to ensure that the product is not subjected to shock loads



If the product has been stored for a very long period, check the condition of the rubber components like suction and delivery flange gaskets and those with the mechanical seal



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 before use



Caution

After a long period of storage, the pump should be inspected before it is put in operation. Ensure the impeller can rotate freely when turned by hand



Caution

The volute casing houses a mechanical seal. Do not attempt to run the pump dry as the mechanical seal can get damaged. Ensure the pump is primed and then only run it

# 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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