Three Phase, 4-Pole Flange-Mounted SCI Motors

Instruction & Operating Manual

Taro™ Pumps

Texmo Industries
Est. 1956

OMIM003A

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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 3043: Code of practice for earthing: Specification
IS 13730: Specifications for Particular Types of Winding Wires
IS 12615: Energy Efficient Induction Motors: Three Phase Squirrel-cage
IS 2223: Dimensions of flange-mounted AC Induction motors

4. Contents of the packing box

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

5. Information about your motor

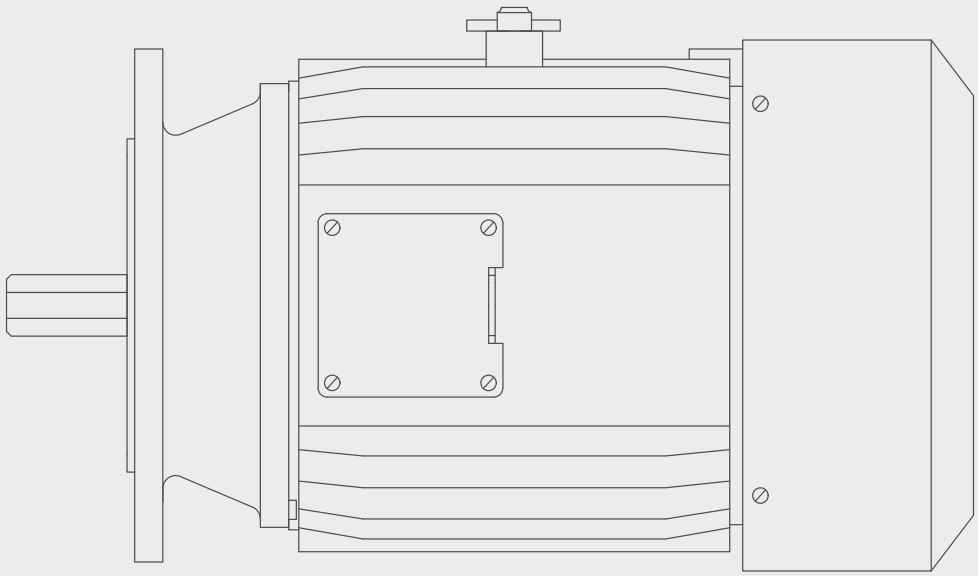
Taro Three Phase 4P flange-mounted SCI motor is manufactured using high quality raw materials and components using state-of-the-art manufacturing facilities and will give trouble-free performance if properly installed and maintained. This motor is mounted on a gear box for driving the paddle wheels of aerators used in aqua-culture.

Prior to installation, go through this manual thoroughly and follow the instructions for installation and maintenance of our motor so as to ensure reliable operation. The motor 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 Three phase 4P Flange mounted motor is shown below in Fig. 1:

Fig. 1 View of Three phase 4P Flange mounted motor



7. Key specifications & features

Standard specification of Three phase 4P Flange mounted motor is shown below in TABLE 1:

Phase	Three
Motor Type	Squirrel-cage Induction Motor – Flange-mounted
Power	2.0 HP
Starting method	DOL
Operating Voltage	350 – 440V
Frequency	50 Hz
Speed	1440 rpm
Duty	S1 Continuous
Insulation Class	B Class
Type of Enclosure	TEFC

Product performance specification

Texmo Industries offers a Three phase 4P Flange mounted motor to meet your requirement of driving the paddle wheels of an aerator through a gear box. Please consult our sales team / your nearest dealer to meet your specific requirements.

Key features: Motor

- The motor shaft is splined
- The motor houses rubber shielded type deep groove ball bearings, pre-filled with grease, to take up the external radial and axial thrust loads
- The rotors are dynamically balanced
- Adequate motor surface area is provided for effective cooling

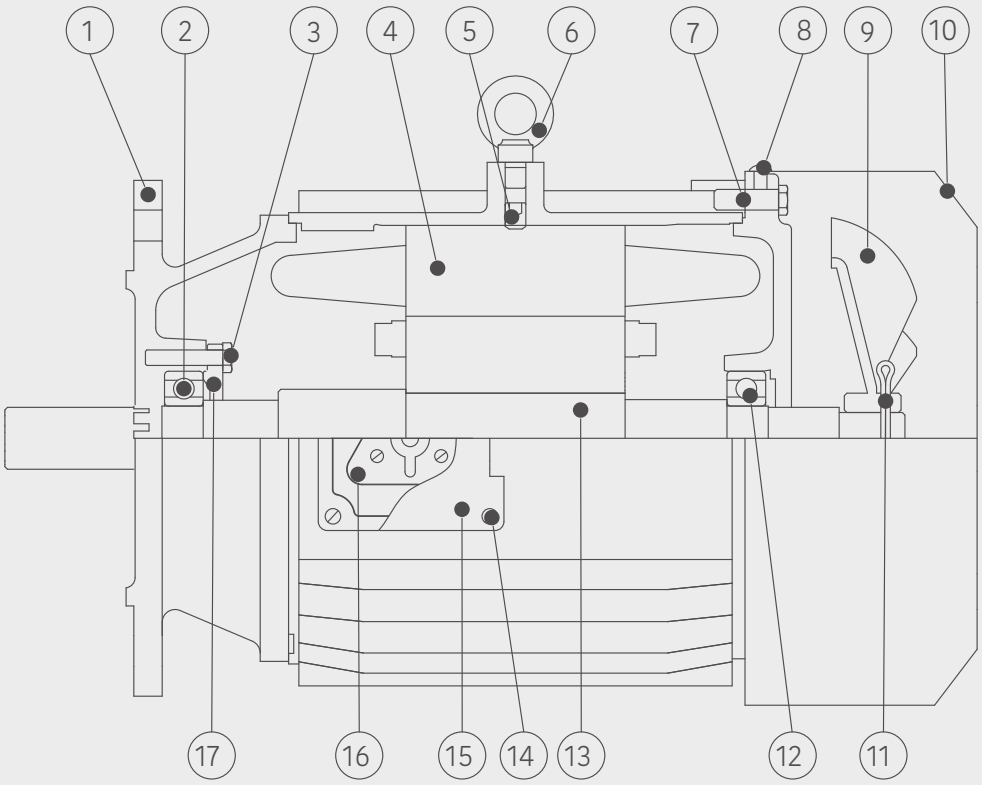
Electrical connection

- The motors are internally wired and pre-connected to the terminal board
- Connect the Three-Phase wires from the starter to the terminal board

8. Cross-section view

Cross-section view of a Three phase 4P Flange-mounted SCI Motor is shown below in Fig. 2:

Fig. 2 Cross-section view of Three phase 4P Flange-mounted SCI Motor



No.	PART NAME
1	Front Cover
2	Deep Grove Ball Bearing
3	Hex. Head Bolt
4	Body With Stator
5	Hex. Socket Screw
6	Eye Bolt

No.	PART NAME
7	Hex. Head Bolt
8	C.H Screw
9	Cooling Fan
10	Fan Shield
11	Split Cotter Pin
12	Deep Groove Ball Bearing

No.	PART NAME
13	Rotor With Shaft
14	C.H Screw
15	Terminal Box
16	Terminal Board
17	Front Cap

9. Pre-installation requirements

Arrangement for Installation

- Use the services of a professional and trained mechanic with experience in erecting Three Phase flange-mounted SCI motors
- Ensure proper safety during installation

General Installation Precautions

- Open the packaging and note down the serial number and model for future reference
- Ensure all fasteners are tightened properly
- As the motor 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 motor. Do not use a power cable with large number of joints as this can result in a significant voltage drop
- While installing the motor, ensure the motor is not subject to shock loads which can damage the motor parts

 Note	If you detect damage or discrepancy in the product, contact the dealer from whom the motor was purchased
 Warning	Do not use this motor in a dusty and damp environment
 Caution	Use trained professionals to install the motor

 Warning	Use a power supply cable that has sufficient rating. Factor in low-voltage operationt
 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

Operation Precautions

 Warning	Switch OFF the power before working on electrical lines
 Caution	Do not use this motor in a very hot environment as this may lead to product failure
 Warning	If any electrical leakage occurs, this could be fatal. Earth the motor

10. Installation procedure

Please follow the below procedure to install the motor.

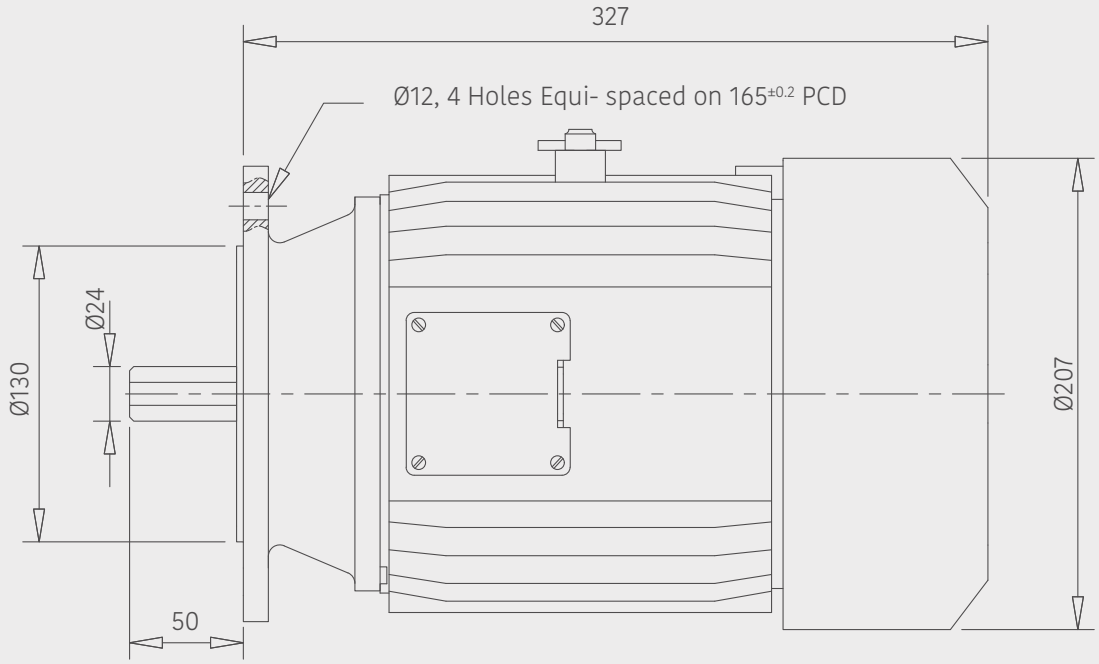
 Caution	The supply voltage should be within the specified voltage range. Failure to observe the precautions given above could cause the motor to malfunction and may lead to current leakage or electrical shock
 Warning	If you find any abnormalities like vibration, noise, smell, etc. from the motor during trial operation, switch OFF the motor and contact the dealer from whom this motor was purchased.

Installation

The following steps are executed prior to installation

- ✔ Measure the insulation resistance using a megger apply 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
- ✔ The flanged mounted motor is mounted on a gear box. Refer Fig. 3, shown below, for mounting and overall dimensions:

Fig. 3 Mounting and overall dimensions of FV90 4P2 BI FM AQ



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 motor
- Ground the motor
- Ensure electrical joints, if any, are properly and adequately insulated
- Connect the cable properly to a starter
- Factor in low-voltage operation while selecting cable size

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

Earthing

 Warning	Be sure to install the ground wire securely. Failure to observe this precaution could damage the motor 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

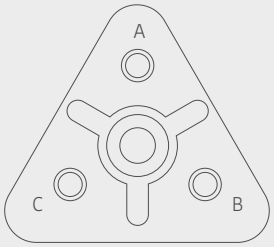
 Caution	Observe relevant electricity board regulations while powering up the pumpset
 Warning	Before connecting the wires to the terminal board, make sure the power supply is properly disconnected. Failure to do so may lead to electrical shock, short, or injury caused by the unintended starting of the motor
 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 Three phase 4P Flange-mounted SCI Motor

Connect the cable from the starter to the terminal board on the flange mounted motor as shown below in Fig. 4:

Fig. 4 Power cable connection to terminal board of three phase flange-mounted motor

Connect three wires from the starter to motor terminals marked A, B & C.
Interchange any two line leads for change of direction.



Checking direction of rotation of Three phase 4P Flange-mounted SCI 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 and internal wiring codes.

- The motor should rotate in the clockwise direction when looking from the drive end
- Power up the motor and check the direction of rotation of the motor shaft
- If the direction of rotation is clockwise when viewed from the drive end, the connections are right
- In case the direction of rotation of the motor shaft is counter-clockwise when viewed from the drive end, interchange any two leads

11. Basic troubleshooting

Warning

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

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:

Fault	**Possible causes**	**Suggested actions**
Motor not starting	No power supply to the motor	Check for availability of power
	Motor coil burnt	Rewind the motor
	Low-voltage operation	Operate in the recommended voltage range
	OLR is tripped in starter	Reset the motor starter overload. If it trips again, check the voltage
	The ELCB has tripped out	Reset the ELCB, If trips again check the insulation resistance of the motor
	Fuse has blown	Replace fuse
	Loose connections	Tighten the electrical connections
	Motor shaft has sheared	Replace the assembly rotor
Motor drawing excessive current	Low-voltage operation	Check and wait for voltage to increase. Contact local EB representative if required
	Motor overloaded	Reduce the load
	Misalignment between motor drive and driven	Align motor and load

Fault	Possible causes	Suggested actions
Motor runs rough and noisy	Motor bearings worn out due to overload	Reduce the overload. Dismantle and replace worn out bearings
	Motor bearings worn out due to misalignment between drivers and driven	Measure misalignment and correct. Dismantle and replace worn out bearings
	Rotor shaft is bent resulting in rotor rubbing against stator bore	Replace rotor shaft. Grout the motor
	Motor flange bolts loose	Tighten the bolts
	Insufficient lubrication in bearings	Replace the bearings

 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 motor as it may lead to severe damage to the motor or injury to personnel. Contact the dealer from whom the motor was purchased

12. Preventive maintenance checks

Precautions to be taken

 Warning	Disconnect the power supply before starting maintenance or inspection of the motor to avoid electrical shock
 Note	If you find any damages or abnormalities, switch OFF the motor 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. The below check list does not represent an exhaustive survey of maintenance steps necessary to ensure safe operation of the motor.

 Warning	Utilise the services of an electrician to carry out electrical measurements / checking the functioning of the starter

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

- Checking the current drawn by the motor at no load conditions and compare with the data recorded when the unit was initially installed
- Any increase in motor current at no load conditions indicates a possible overload condition
- Measure the insulation resistance of the winding to check the condition of the motor
- Check the alignment between motor and driven

13. Do’s and don’ts

Do’s	Don’ts
Align the motor and drive shaft	Do not overload the motor. Ensure that the current does not exceed that mentioned on the name plate
Rotate the shaft to ensure that motor is not jammed	Do not restrict the space behind the cooling cover as this will obstruct the flow of air required for cooling of the motor
Ensure proper earthing is provided	Do not cover the product as this will prevent effective cooling of the motor
Check all fasteners are tight	Restrict the number of joints on the cable. More the cable joints, more will be the voltage drop
Motor is IP44 protected. Provide protection from rain	Do not use undersized electric cables between motor and Starter Panel. Factor in low-voltage usage
When covering the motor to protect from water entry, provide sufficient openings for ventilation. Design the openings so that water does not enter through the openings provided	Do not earth to a water line or gas line

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

- The Three Phase 4P Flange-mounted motor is 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 motor 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 motor 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 lubrication of the bearings

 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

16. Company contact information

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

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