

MAGNUM[®]

More Power, Better Controls

USER MANUAL

THREE PHASE STAR DELTA STARTER - TRISHAKTI

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INTRODUCTION

Dear Customer,

Congratulations on purchase of MAGNUM SEMI/FULLY AUTOMATIC STAR DELTA MOTOR STARTER. Magnum Three Phase MaK-1 Star Delta Motor Starter is a powerful controlling device for your submersible pump made with heavy duty components, which protects the pump from hazards caused due to over-current and voltage.

Located in Bangalore, Kalp Controls commenced its operations in the year 2009. At Kalp Controls, we are focused on offering you heavy duty

1. Submersible Pump Panel - DOL & Star Delta
2. Open Well Pump Panel
3. Starters - DOL & Start Delta
4. Single Phasing Preventer & Auto Start Unit.
5. Spares like Contactor, Relay , Capacitor, Meters etc.

ABOUT MAGNUM SEMI/FULLY AUTOMATIC STAR DELTA MOTOR STARTERS

Magnum Star Delta Starters are controlling devices for your submersible Pumps/Motors. These are made from quality raw materials, enabling it to protect and control your motor consistently.

Functions

1. Switches your pump/ motor ON and OFF.
2. Protects the pump from over-current.
3. Trips when there is a low voltage & persistent overload on the motor.
4. Ensures reliable performance in high ambient temperatures, humidity & under-voltage conditions.

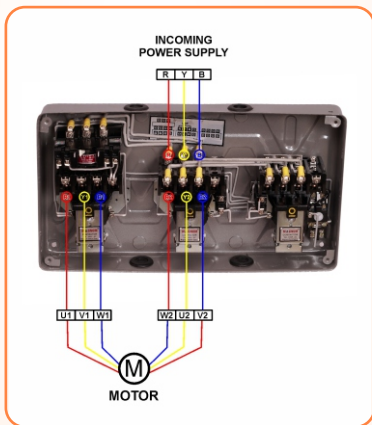
Salient Features

1. Powder coated MS enclosure for complete corrosion resistance.
2. Rugged MaK-1 contactors with wide voltage band (250-440V).
3. Fitted with MaK-1 type relay for reliable overload protection.
4. Manual reset facility after overload protection.
5. ON/OFF status is visible through the window provided on top of enclosure.
6. A latch on the push button can be used to keep the stop button locked, thus preventing accidental starting.
7. Current peak on changeover from star to delta.
8. Mechanical load on changeover from star to delta.

9. Easy & quick mounting.
10. Ergonomic design with aesthetic looks.
11. There is a provision for using an auxiliary contact block with configuration 2No + 2NC.

INSTALLATION INSTRUCTIONS

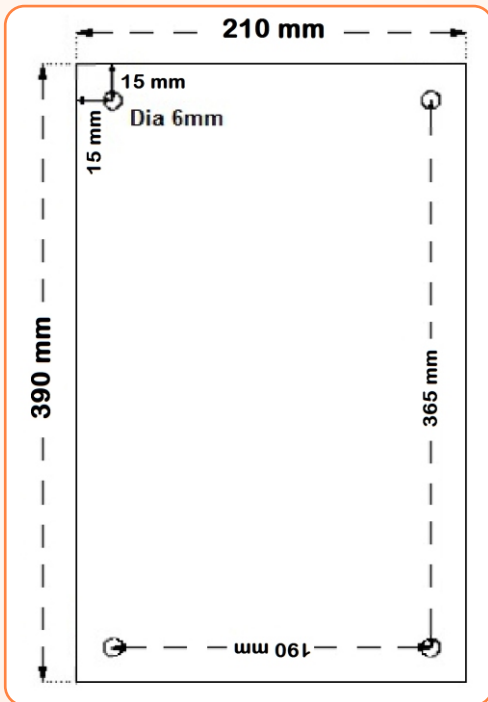
- It is very important to ensure the current rating (Power in HP) of your motor and Starter are same.
- Drill holes with the help of the given template.
- Starter to Motor Connection



- Connect the supply cables to the Delta Contactor where terminals are marked as R, Y and B in the above figure.

- Connect the motor cables to the Main contactor and Delta Contactors where terminals are marked as R1, Y1, B1 and R2, Y2, B2 in the above figure.

MOUNTING TEMPLATE (Not to scale)



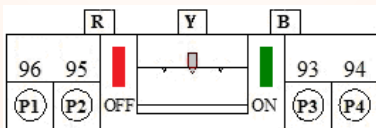
SWITCHING AND OPERATING

- Ensure the load relay range matches to the ampere rating in your motor.

Switching On and Off

- Switch on the supply.
- To start the motor, press the START (green) button for 3 - 4 seconds and immediately release the button after motor starts. **(Not more than 4 seconds) (Never attempt to press the green button when the motor is running)**
- The motor can be switched off by pressing STOP (Red) button.
- Rubber Bushes are provided near the connecting terminals. Just make holes in the rubber bushes for connection and don't remove it. They offer a degree of ingress protection.
- If the motor/pump switches off automatically, (may be due to over-current) please press the reset button (OFF) on the left side of overload relay inside the panel.

MaK-1 Overload Relay



TECHNICAL SPECIFICATIONS

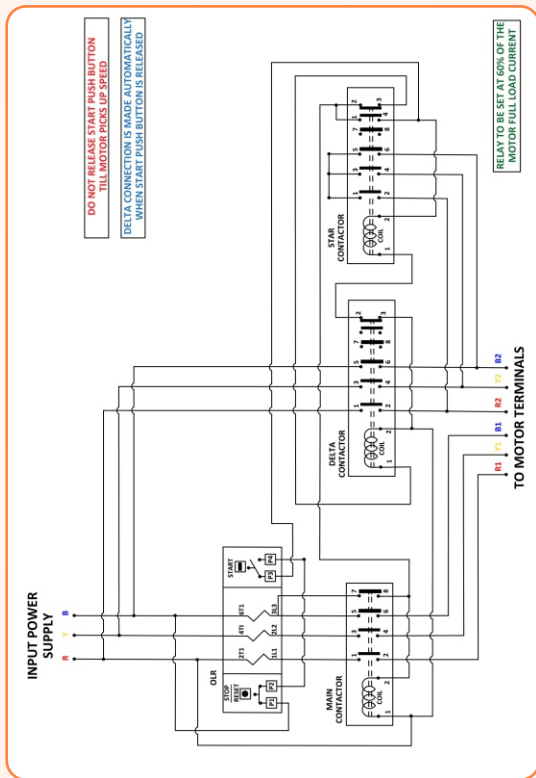
1. Power range : Up to 20 HP
2. Coil Voltage : 440 V
3. Operating Voltage : 70% to 110% of coil voltage
4. Pick up voltage : Minimum 70% of coil voltage
5. Drop off voltage : Below 50% of coil voltage
6. Contactor 4P : MaK-1/MaK-1Heavy Duty(4P)
7. Relay 4P : MaK-1 (4P)
8. Area : Mak-1(210 * 390 * 1050) mm
9. Net Weight : 5.3 - 5.5 Kilo grams
10. Frequency : 50Hz
11. Insulation Voltage Ac (Vi) : 660V
12. Ambient Temperature : -25°C to +55°C
13. Terminal Capacity : 1 * 16 (mm)² or 2 * 10 (mm)²

Normal Configuration of the Starter

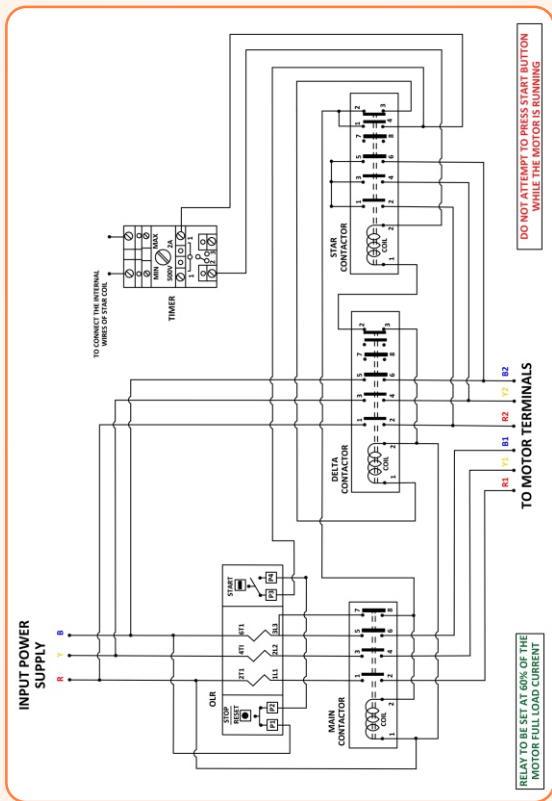
Sl. No.	Power (HP)	Catalogue No		Relay Range (A)
		SASD	FASD	
1	7.5	SDS7H	SDF7H	6-10
2	10	SDS10	SDF10	9-14
3	12.5	SDS12H	SDF12H	11-18
4	15	SDS15	SDF15	13-21
5	17.5	SDS17H	SDF17H	20-32
6	20	SDS20	SDF20	20-32

CIRCUIT DIAGRAM:

1. THREE PHASE SEMI AUTOMATIC STAR DELTA STARTER



2. THREE PHASE FULLY AUTOMATIC STAR DELTA STARTER



PRECAUTIONS & MAINTENANCE

- It's best that a qualified electrician installs the starter and repairs it in case of any problem.
- A dust free environment is vital for long run of the starter. It is very important to keep the starter away from water or moisture. In very humid places it is strongly recommended to keep it in a closed setting.
- The best way for prolonged life of the starter is to periodic inspection of the contactor contacts and keeping them free of dust and water.

TROUBLE SHOOTING

1) Contact Maintenance

Contact Tips are Alloys which have Silver Compositions. Depending upon the atmospheric conditions., that is Very Humid & Moisture Conditions, the contacts may have excessive tarnishing (Black Tarnish). Only during excessive tarnishing, do the following to clean the contact tips.,

- Rub the Contact Tips Lightly with Fine Emery Paper (Preferably Zero Size) **DO NOT FILE THE CONTACT**
- Remove small particles by rubbing with wet Cotton Cloth or with wet Clean cloth
- Remove the water on the contact tip surface with a dry, clean cloth. The Contact Tips should be completely Dry.

2) **Motor works in Star . However it does not work properly In Delta and refuses to take load.**

- Check if only three wires are being terminated in terminal box of motor.
- Six wires should be connected to starter.
- If shorting links are present, they should be removed.

3) **Motor starts with difficulty in Star or trips when additional load is present**

- For Fully Automatic starter, reduce time delay from Star to Delta in case it is kept very long.
- If a semi-automatic starter is being used, switch over from Star to Delta earlier than done previously.

4) **Relay has been changed in semi-automatic starter, however when the main switch is on, the motor starts immediately without the necessity of pressing the start button. Motor stops in Star itself.**

- You may have changed the original relay yourself.
- All factory-made relays have loop-wires 2-3 wired, in semi-automatic starters.

- 2-4 terminals on relays must be connected. Check relay before connecting it on starter.

5) **If motor/pump does not start:**

- Reset the relay and then try starting again
- Ensure adequate supply voltage.
- Check the contacts of the contactor.

6) **If motor draws excess current:**

- Absence of water or load in the pump.

7) **If motor trips after sometime:**

- Ensure that the relay range and setting is correct.

SPARES AND ASSEMBLIES AVAILABLE FOR THIS STARTER

Part Description	Specification	Part No.
Magnum MaK-1 Contactor 4P 415V	7mm 8mm	CTK7 CTK8
Magnum Coil 440V	MaK-1	CTK
MaK-1 Relay	6-10 A 9-14 A 11-18 A 13-21 A 20-32 A	RTK10 RTK14 RTK18 RTK21 RTK32
MaK-1 Spare Kit Set	7 mm 8 mm	KK7 KK8
MaK-1 Base & N:10	7 mm 8 mm	HK7 HK8
Thermal Timer	MaK-1	TK
DOL Button	MaK-1	BKD

Warranty Policy

1. This product carries a warranty, against manufacturing defects only for a period of **12 months** from the **date of** manufacturing.
2. The warranty is however subject to provision of proper usage, efficient maintenance and **does not cover** defects arising out of **fire accident, Voltage Surge, Inefficient maintenance, faulty operation and willful or accidental damage**. Warrant is not covered for charred or burnt components at all.
3. The company will not be liable for any consequential loss, injury or damages attributable to defect or failure of its products.
4. We believe in our products and hence provide you with product guarantee, should it prove to be defective due to faulty workmanship or otherwise, we will remedy the defect or replace the faulty parts or the whole product at our discretion, as soon as possible, free of cost.
5. This product is made from quality raw materials and skilled assemblers. We believe in our product and hence provide you with this warranty of 12 months.
6. Proof of purchase (Invoice) is to be produced to avail the warranty.