MAGNUM®

More Power, Better Controls

# USER MANUAL

## THREE PHASE

# STAR DELTA CONTROL PANEL - VAJRA

MaU

**To find more about us and our products, scan below QR codes**

*Facebook* *Videos* *Website*


## KALP CONTROLS

Unit 1 : #40, 2nd Main Road, Pete Chennappa Industrial Estate,
Kamakshipalya, Magadi Road, Bangalore-560079. (India)

Website: www.magnumswitchgear.com

*For queries and suggestions mail us to* info@magnumswitchgear.com

***Customer Care No: +91-8884759222***

# INDEX

## INTRODUCTION

**Dear Customer,**

Congratulations on purchase of MAGNUM THREE PHASE STAR DELTA CONTROL PANEL - VAJRA. Magnum Three Phase Star Delta Control Panel [MaU Model] 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 Preventor & Auto Start Unit.
5. Spares like Contactor, Relay , Capacitor, Meters etc.

## ABOUT MAGNUM STAR DELTA CONTROL PANEL - VAJRA

MAGNUM Three Phase Star Delta Control Panels [FASD] are controlling devices for your submersible pumps. These are made from quality raw materials, enabling it to protect and control your pump consistently.

**Functions**

1. Switches your pump ON and OFF.
2. Being based on Star-Delta mechanism the starting torque & current is considerably reduced on the motor.
3. Protects the pump from:
    - Over – Current
    - Single phasing condition
    - Phase Reversal
    - Phase Unbalanced Condition
    - Short Circuit.
4. Enables Motor to automatically Switch-On if power resumes when kept in Auto-mode.
5. Indication of power supply to the panel.
6. Indicates current drawn by the motor.
7. Indicates voltage supplied to the panel.

**Salient Features:**

1. Powder coated MS enclosure for complete corrosion resistance & sturdiness.
2. Rugged MaU Contactor with wide voltage band (250V to 440V).
3. Fitted with MaU type relay for reliable overload protection.
4. A latch on the push button can be used to keep the stop button locked, thus preventing accidental starting.
5. Manual reset facility after overload protection.
6. Fitted with SDz5 type preventor with inbuilt Star Delta Timer used for sensing voltage and for protection from Single Phasing, Phase Reversal and Voltage Imbalance Conditions to the motor.
7. SDz5 Preventor can be chosen to run in three modes.
   - Auto – To automatically start the motor after the power resumes.
   - Manual – To avoid automatically starting the motor after the power-resumes.
   - Bypass – This can be used if you want to turn-off single phasing protection and Auto Feature. (This is not Recommended)

8. There is a provision in the preventor to have a ON Time Delay Setting ranging from 30 seconds to 5 minutes (before the motor starts)

9. There is a provision in the SDz5 to have a time delay from 6 to 30 seconds during Star-Delta Conversion.

10. All connections are terminated through appropriate crimping Luggs.

11. Fitted with Digital Meter to show the voltage (*Incoming Power Supply)* and Current *(Motor Current)*.

12. Indication lamps for voltage between the phases and Output to Motor.

13. There is a provision to connect Dry-Run Preventor in the panel. [D1, D2]

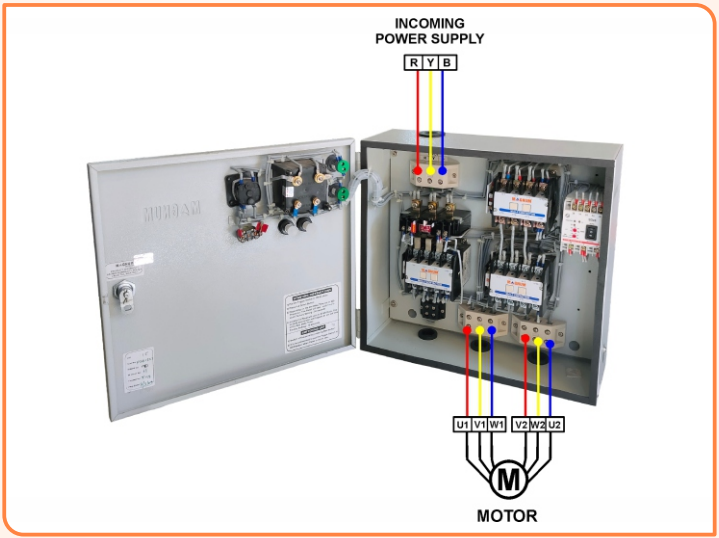
14. Ergonomic design with aesthetic looks, Easy & quick mounting.

15. No screw protrusion from the panel, hence additional safety from water, dust, corrosion and electric shock.

16. There is a provision for using an auxiliary contact block with configuration 1NO + 1NC.

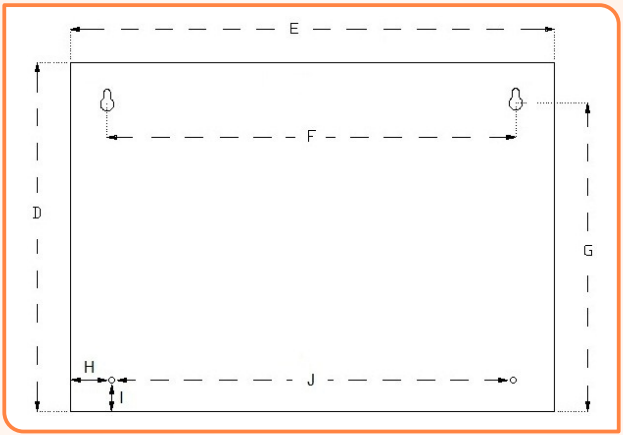
## INSTALLATION INSTRUCTION AND CONNECTIONS

- 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 terminals **R, Y** and **B** as shown in the above figure.
- Connect the motor cables to the terminals **A1, B1, C1** and **A2, C2, B2** as shown in the above figure.

**MOUNTING TEMPLATE** (Not to scale)




| D (mm) | E (mm) | F (mm) | G (mm) | H (mm) | I (mm) | J (mm) |
|---|---|---|---|---|---|---|
| 360 | 380 | 270 | 328 | 48 | 28.5 | 283.5 |

**SWITCHING AND OPERATING**

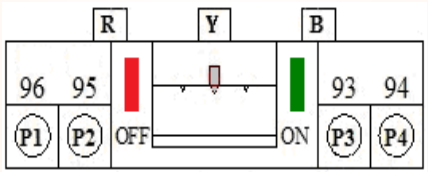
- Ensure the over load relay range matches to the ampere rating in your motor.

**Switching On and Off**

- Switch on the power supply.
- Input Indicator will glow.
- Put the Toggle Switch in ON Position
- Press the Green Button. (**Never attempt to press the green button when the motor is running)**
- Depending on the On-Delay Time set in SDz5 Preventor, The Panel will take such time to start. Factory Setting - 30 seconds
- Initially the Panel will start in **STAR Mode**, Star to Delta Conversion will happen as per set time in the Star Delta Timer. Factory Setting - 9 seconds.
- Output Indicator will glow.
- You can now read the motor current and incoming power supply in Digital Meter.

- The motor can be switched off by pressing STOP (Red) button.
- It is recommended to put the Toggle Switch in Off-Position when Panel is not is use.
- 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 overload relay inside the panel.

For MaU Controller:



## TECHNICAL SPECIFICATIONS

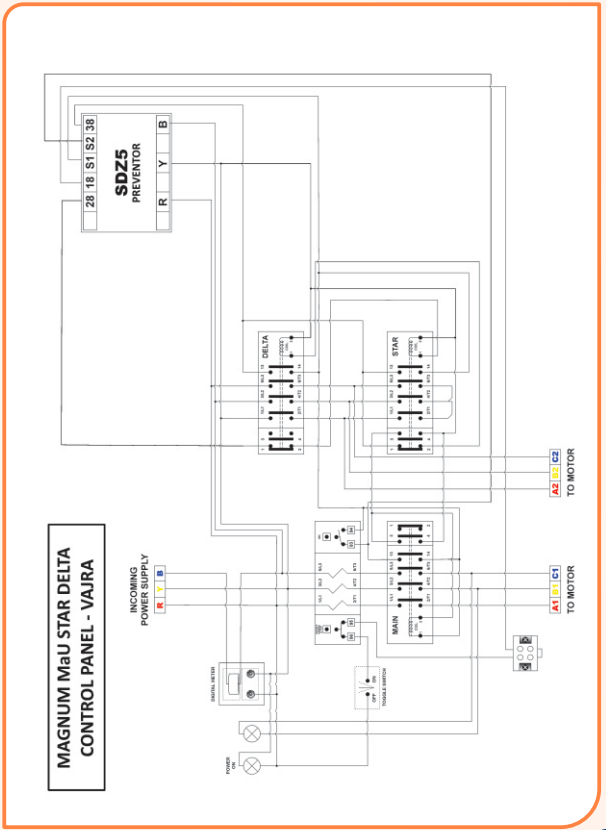
| | | |
|---|---|---|
| 1. | Power range | : Up to 20 HP |
| 2. | Coil Voltage | : 440 V |
| 3. | Operating Voltage | : 70% to 110% of coil voltage |
| 4. | Pick up voltage | : Minimum 60% of coil voltage |
| 5. | Drop off voltage | : Below 50% of coil voltage |
| 6. | Contactor 4P | : MaU 4P (16A, 25A, 32A, 40A) |
| 7. | Relay 4P | : MaU (3P) |
| 8. | Area | : (360 *380 *143) mm |
| 9. | Net Weight | : 9.9 – 10.0 Kg |
| 10. | Frequency | : 50Hz |
| 11. | Insulation Voltage Ac (Vi) | : 660V |
| 12. | Ambient Temperature | : -25°C to +55°C |
| 13. | Terminal Capacity | : 1 * 16 [or] 2 * 10 (mm)^2 |

**Normal Configuration of Star Delta Control Panel:**

| Sl. No. | Cat. No | HP | Relay Range (A) |
|---|---|---|---|
| 1 | PSDU7H | 7.5 | 6-10 |
| 2 | PSDU10 | 10 | 9-14 |
| 3 | PSDU12H | 12.5 | 11-18 |
| 4 | PSDU1521 | 15 | 13-21 |
| 5 | PSDU17H | 17.5 | 20-32 |
| 6 | PSDU2032 | 20 | 20-32 |
| 7 | PSDU2042 | 20 | 28-42 |

## PANEL DIMENSIONS

## CIRCUIT DIAGRAM:



## PRECAUTIONS & MAINTENANCE

- It's best that a qualified electrician installs the panel and repairs it in case of any problem.

- A dust free environment is vital for long run of the panel. It is very important to keep the panel 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 panel is to periodic inspection of the contactor contacts and keeping them free of dust and water.

## TROUBLE SHOOTING

1) **Motor starts when the green button is pressed, Once released it switches off.**

   - Check if all six connections are provided to the output terminal.
   - Check if all the six connections are connected as per phase sequence mentioned in the sticker.
   - There are few instances where phase wires from motor are not correctly marked. Find out if any phase connection has been reversed and rectify it.

**2) Motor starts with difficulty when start button is pressed**

- In this case release the start button earlier than what you have been doing.

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

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

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

- Absence of water or load in the pump.

## SPARES AND ASSEMBLIES AVAILABLE

| PART DESCRIPTION | SPECIFICATION | PART NO |
|---|---|---|
| Magnum MaU Contactor 4P 415V | 16A<br>25A<br>32A<br>40A | CTU16<br>CTU25<br>CTU32<br>CTU40 |
| MaU Relay | 6-10 A<br>9-14 A<br>13-21 A<br>20-32 A | RTU10<br>RTU14<br>RTU21<br>RTU32 |
| Magnum Digital Meter | 500V, 50A | DM55 |
| MaU Coil | 415V | CTU |
| MaU Auxiliary | - | AU |
| MaU DOL Button | MaU | BUD |
| MaU Spare Kit | 16A<br>25A<br>32A<br>40A | KU16<br>KU25<br>KU32<br>KU40 |
| MaU Housing Body | - | HU |
| Porcelain Terminal Block | 3Way/60A | CPC63 |
| LED Indicator | 440V, 22mm, Green | ITL22G |
| Toggle Switch | 10A, SPST | BTS |

## 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.