



More Power, Better Controls

## USER MANUAL

# THREE PHASE MaC-2 DOL STARTER

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### **KALP CONTROLS**

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## **INTRODUCTION :**

**Dear Customer,**

Congratulations on purchase of MAGNUM MaC-2 DOL MOTOR STARTER. Magnum Three Phase MaC-2 Direct On Line Motor Starter is a powerful controlling device for your pump/motor 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 & Star Delta
4. Single Phasing Preventor & Auto Start Unit.
5. Spares like Contactor, Relay, Capacitor, Meters etc. .

## **ABOUT MAGNUM DOL MOTOR STARTERS**

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

## Functions

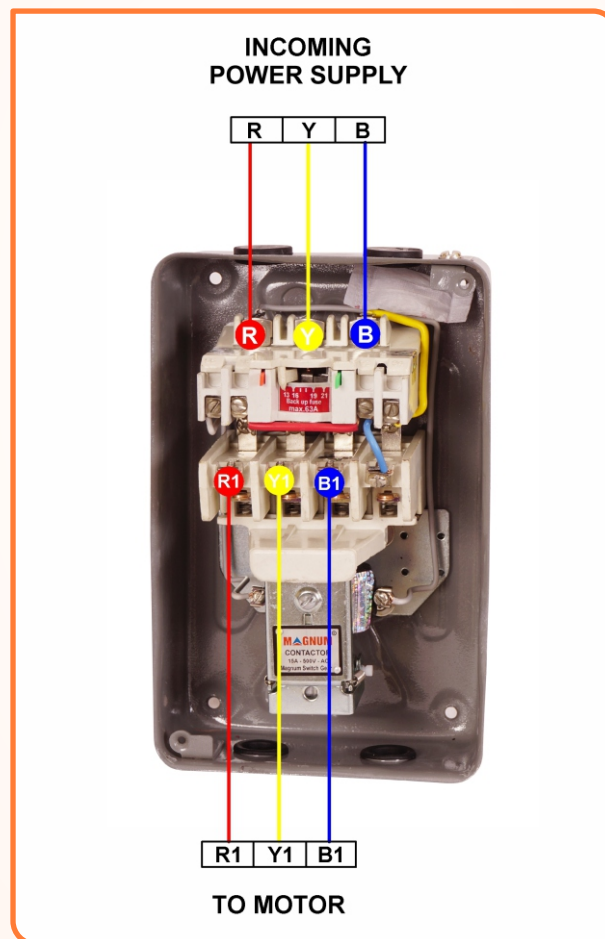
1. Switches your pump/ motor on and off.
2. Protects the pump from over-current.
3. Trips when there is a low voltage & persistent overload on the motor.
5. Ensures reliable performance in high ambient temperatures, humidity & under-voltage conditions.

## Salient Features

1. Powder coated MS enclosure for complete corrosion resistance & sturdiness.
2. Rugged MaC-2 Contactor with wide voltage band (250V to 440V).
3. Fitted with MaC-2 type relay for reliable overload protection.
4. DMC Housed Contactor and Relay for excellent heat resistance.
5. Manual reset facility after overload protection.
6. A latch on the push button can be used to keep the stop button locked, thus preventing accidental starting.
7. On/Off status is visible through the window provided on top of enclosure.
8. Easy & quick mounting. Ergonomic design with aesthetic looks.
9. There is a provision for using an auxiliary contact block with configuration 1No + 1NC.

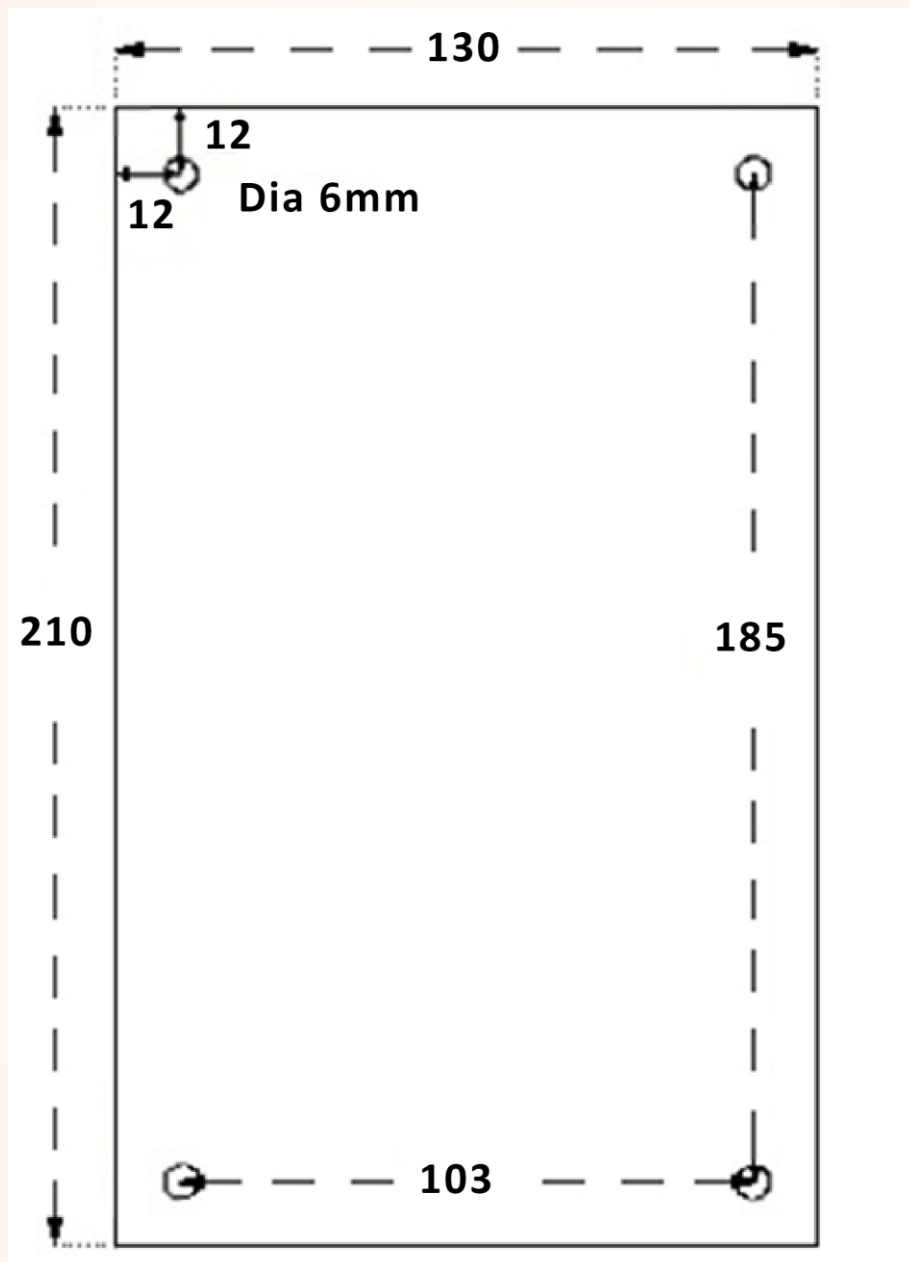
## INSTALLATION INSTRUCTIONS AND CONNECTION :

- Ensure the current rating (power in H.P) of your motor and this Starter matches.
- Drill holes with the help of the given template.
- Mount the Starter tight and straight.
- Starter to Motor Connection,



- Connect the supply cables to the over load relay where terminals are marked as R, Y and B.
- Connect the motor cables to the contactor where terminals are marked as R1, Y1 and B1.

## MOUNTING TEMPLATE : (Not to Scale)



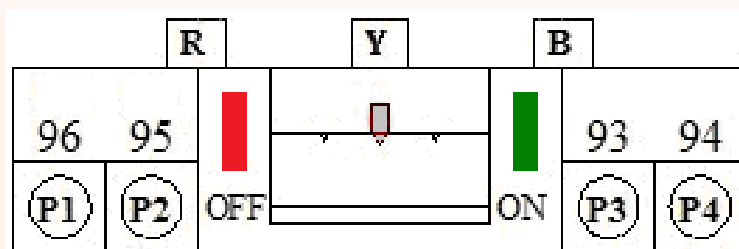
**MaC-2 DOL Starter**

## SWITCHING AND OPERATING :

- Ensure the over 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 on the overload relay which is Red in colour as shown below.



**MaC-2 Over Load Relay**

## TECHNICAL SPECIFICATIONS :

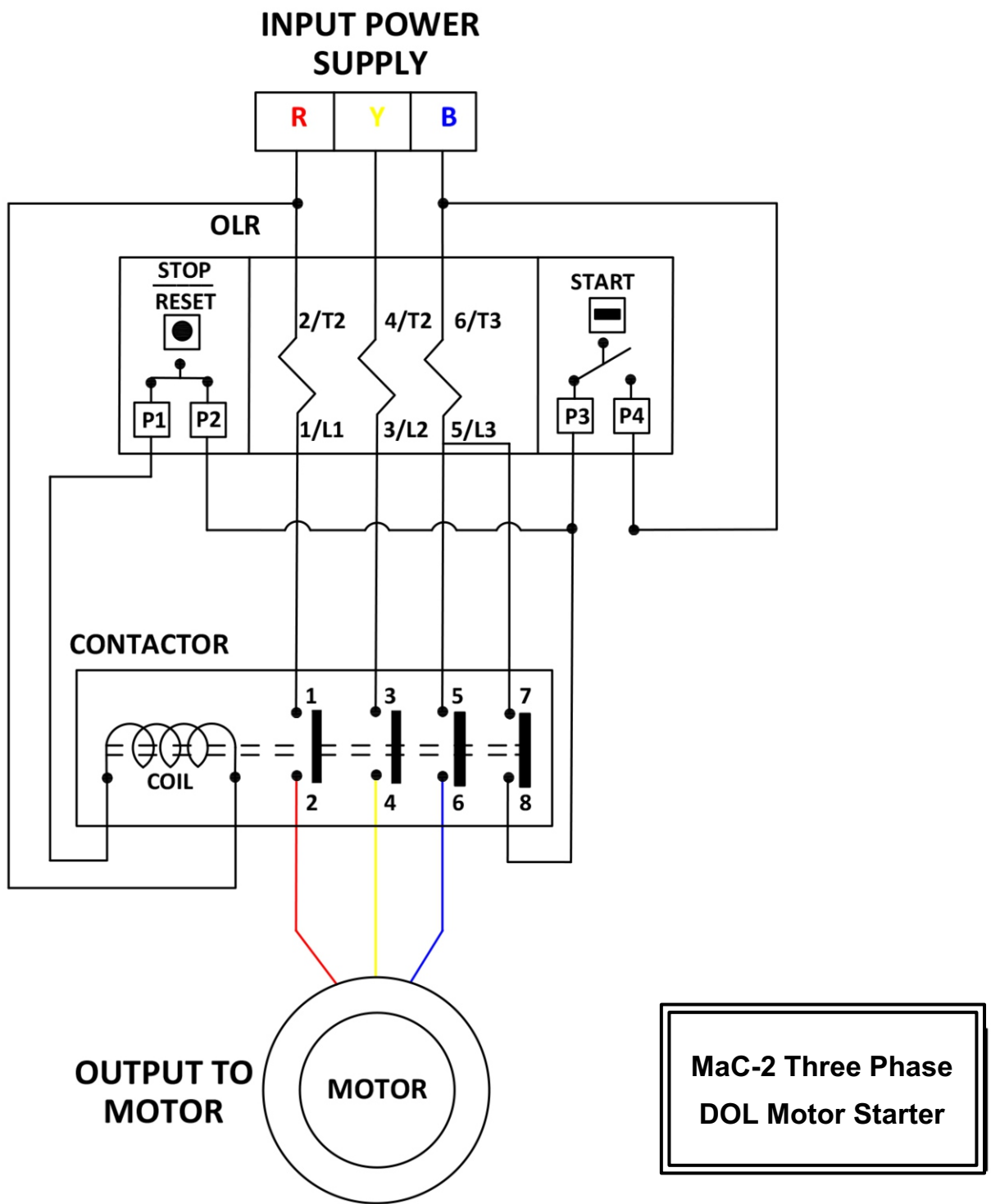
1. Power range : Up to 10 HP
2. Coil Voltage : 440 V
3. Operating Voltage : 70% to 110% of coil voltage
4. Pick up voltage : Minimum 70% of coil voltage
5. Drop off voltage : Below 50% of coil voltage
6. Contactor 4P : MaC-2
7. Relay 4P : MaC-2 4P
8. Area : (220 \* 140 \*120) mm
9. Net Weight : 1.85 - 2.0 Kilo grams
10. Insulation Voltage Ac (Vi) : 660V
11. Frequency & Ambient Temperature : 50Hz & (-25°C to +55°C)
12. Terminal Capacity : 1 \* 16 (mm)<sup>2</sup> or 2 \* 10 (mm)<sup>2</sup>



## Normal Configurartion of the Panel

Sl. No.	Power (HP)	Cat. No		Relay Range (in A)	Recommended Fuse/MCB (HRC) (A)
		NORMAL	HEAVY DUTY		
1	1.5	STDC4	STDCH4	2.5-4	6
2	2	STDC6	STDCH6	4-6.5	10
3	3	STDC10	STDCH10	6-10	16
4	5	STDC14	STDCH14	9-14	20
5	7.5	STDC18	STDCH18	11-18	25
6	7.5	STDC21	STDCH21	13-21	32
7	10	STDC32	STDCH32	20-32	40

**CIRCUIT DIAGRAM :**



## **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 control Panel 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.

### **1) Humming/ Chattering Noise**

- Check the voltage supply., Voltage could be too low for operation that is less than 65% of rated operational voltage., Wait for stable voltage and then switch on.
- Magnet Cores may be unclean due to either dirty environment or excessive Carbon Deposits., Clean them gently using Dry cloth., Be careful that you don't disturb the alignment of the Core.
- Contact Tips may be unclean., Clean them as said above.

### **1) Motor does not restart immediately after Tripping on Overload**

- It takes a little time 2-4 minutes for Thermal Bimetals to Cool., Hence wait for 2-4 minutes for restarting after overload tripping.

### **2) If motor/pump does not start**

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

### **3) If motor draws excess current**

- Absence of water or load in the pump.

## SPARES AND ASSEMBLIES AVAILABLE FOR THIS STARTER :

Part Description	Specification	Part No.
Magnum MaC-2 Contactor 4P 415V	7mm 8mm	CTDC7 CTDC8
Magnum MaK-1 Spare Kit	7mm 8mm	KK7 KK8
Magnum MaK-1 Moving Sets	7mm 8mm	KKM7 KKM8
MaC-2 Relay	2.5-4 A 4-6.5 A 6-10 A 9-14 A 11-18 A 13-21 A 20-32 A	RTDC4 RTDC6 RTDC10 RTDC14 RTDC18 RTDC21 RTDC32
Magnum MaK-1 Coil	415 V	CTK
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**. Warranty 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.