Micro Controller based Star-Delta-Star Starter using

intelligent . Motor &poWer Manager

i.MWM-IO

Display

Save



Control

Analyze

Protect

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Next Generation intelligent Motor Control Centre : i.MCC With intelligent . Motor &poWer Manager :i.MWM-IO

Principle : *When the motor is loaded for less than 50% of Motor's full load capacity, the motor can be switch over to Star for Energy Saving purpose.*

Again when load increases beyond 50% of Motor's full load capacity it will automatically convert to Delta without disturbing process.

Ideal Solution for :



i.MWM-IO/SDS

- Stirrer/Blenders/Reactor
- Crusher / Centrifuge
- Air Compressors
- Fly Wheel-Lathe m/c.
- Conveyors

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Motors used to operates high inertia loads require higher capacity motors to meet the starting torque requirements. While in normal running the same motors draws very lesser power than its capacity. In such a cases motor can be start with Star-Delta Starter & as it start to draw a 50 %lower power than its capacity, it can be run in Star to improve its Power Factor and hence sizable amount of Energy can be save.

In such cases, if the motors are connected with DOL starter are worthwhile to convert to a Star Delta starter along with i.MWM-IO/SDS module to get Energy Saving.

Advantages :

- *Energy saving*
- *Reduction in KVA, contributing to reduction in maximum demand.*
- *Improvement in power factor*
- *Motor runs cooler leading to increased motor life.*

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Scope of saving :

Below mention table showing the scope for Energy Saving for the motors of different capacity at different loading condition. The actual values may vary from motor to motor & the savings can be higher or lower depending upon electrical & mechanical condition of the motor.

Load	Savings		
	1to 15HP	16 to 40 HP	41 to 150HP
No Load	76 %	60 %	45 %
10 %	40 %	30 %	22 %
20 %	26 %	22 %	20 %
30 %	15 %	13 %	12 %
40 %	9 %	8 %	7 %
50 %	6 %	5 %	4 %

** Source : Tata Energy Research Institute-Banglore*

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Feature : i.MWM-IO	
A) Monitoring:	
• *Three Phase Current*	*(A) :* R-Y-BAmp
• *Three Phase Voltage -Line & Phase*	*(V) : RN-YN-BN& RY-YB-BR*
• *Three Phase Power Factor*	*(Φ) : P.F/Phase & Average*
• *Three Phase Active Power*	*(KW) : KW/phase & Total KW*
• *Three Phase Active Power*	*(KWh) : KWh/Phase& Total KWh*
• *Operating Hours (Hrs)*	
• *Start Counter (Nos.)*	
• *Trip Counter (Nos.)*	
• *Status of Three Phase Current at Last Fault : R: XXXX A | Y: XXXX A | B: XXXX A*	
• *Status of Three Phase Voltage at Last Fault : RN:XXXX V | YN : XXXX V | BN: XXXX V*	

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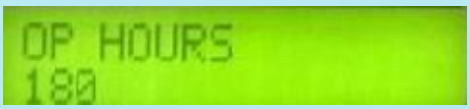
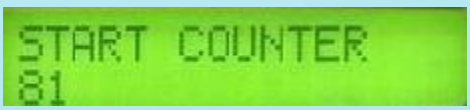
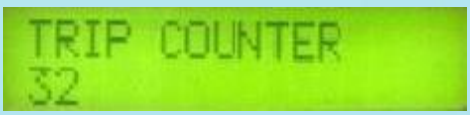
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Feature : i.MWM-IO

B) Protections :

- Voltage base Single Phasing Protection : SPP Voltage
- Over Voltage Protection : (Settable) 230 VAC to 300 VAC between any Phase w.r.t. Neutral
- Under Voltage Protection : (Settable) 220 VAC to 130 VAC between any Phase w.r.t. Neutral
- Current base Single Phasing Protection (Settable Time) : SPP Current
- Over Current (Inverse / Definite Time)
- Under Current Protection (Settable Definite Time)
- Phase Reversal Protection (Enable / Disable)
- Current Unbalance Protection
- Locked Rotor / Stall Protection (Settable Value)
- Short Circuit Protection
- Earth Fault Protection

Display of few parameter for i.MWM –IO during Healthy Run condition

Running Current	
Running Phase Voltage	
Running P.F-Phase wise	
Running Average P.F	
Running Power Phase wise	
Running Total Active Power	
Running Total Op. Hours	
Total Nos. of Starts Count	
Total Nos. of Trip Count	
Status of Current at Last Trip	
Status of Voltage at Last Trip	

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