

**TECHNICAL SPECIFICATION:**

Cat. No.:		MK21D5	MC21D5	MN21D5	MA21DN	MOF1D51	MD21DF	MG21DH	MG21DF	MGD1DR	
Function		Phase Control					Phase and Voltage Control				
Supply Voltage (☰)		208 to 480 VAC, 3P3W (-12% to +10% of ☰)								400 VAC, 3P3W	
Frequency		47 to 63 Hz									
Power Consumption		3 VA (Max.)									
Adjustable Nominal Voltage (☰)		N.A.					208 - 220 - 380 - 400 - 415 - 440 - 480 VAC			N.A.	
Trip Levels	Under Voltage	N.A.					-2 to -20% of ☰		-5 to -25% of ☰		
	Over Voltage	N.A.					2 to 20% of ☰		5 to 25% of ☰		
	Asymmetry	N.A.		30% fixed		5 to 15%		10% fixed		N.A.	
Setting Accuracy		+/- 5% of full scale									
Setting Accuracy (±10% of full scale)	Operate Time		<750 ms			5 s fixed		<750 ms		5 s fixed	
	Power ON Delay		<1.5 sec								
	Release Time	UV, OV and Asymmetry	~ 550 ms			<0.55 to 15s		~ 550 ms		<0.55 to 15s	
		Phase Reverse	<65 ms.								
Phase Loss		For Phase Loss Fault in the absence of Motor load Release Time is <65 ms.									
LED Indications	R/☰	Healthy	R Continuous ON				☰ Continuous ON				
		Ph Reverse	R Flashing		N.A.		R Flashing		N.A.		
		Asymmetry	N.A.		R OFF		R OFF		R Flashing		N.A.
	OV		N.A.					Over Voltage			
	UV		N.A.					Under Voltage			
	AS		N.A.					Asymmetry			
	ALL LEDES	OFF	Phase Fail or Higher Cut OFF(> 560 VAC) or lower cut off (<175 VAC) (for MOF1D51,MK21D5,MC21D5 & MN21D5 Lower Cut Off is < 138 VAC)								
Flashing		N.A.					☰ Ref. Pot changed during running conditions			N.A.	
Relay Output	Contact Rating		1 C/O , 5A (Res.) @ 250 VAC / 30 VDC								
	Utilization Category	AC - 15	Rated Voltage (Ue): 120/240 V; Rated Current (Ie): 3.0/1.5 A								
		DC - 13	Rated Voltage (Ue): 24/125/250 V; Rated Current (Ie): 2.0/0.22/0.1 A								
Contact Material		Ag Alloy									
Mechanical Life Expectancy		3 x 10 <sup>6</sup> Operations									
Electrical Life Expectancy		1 x 10 <sup>5</sup> Operations									
Operating Temperature		-15°C to +60°C									
Storage Temperature		-20°C to +80°C									
Humidity (Non-Condensing)		5 to 95 % (Non-Condensing)									
Max. Operating Altitude		2000 m									
Degree of Protection		IP-20 for Terminals ; IP-30 for Housing									
Pollution Degree		II									
Housing		Flame Retardant UL 94-V0									
Mounting		Base / Din-Rail (35 mm Symmetrical)									
Dimensions in mm (WxHxL)		18 x 59 x 90									
Weight (Unpacked)		70 gm Approx.									
Certifications		RoHS									

**SUPPLY MONITORING DEVICE**
**SERIES : SM-175**
**Cat. No.:**

**MK21D5**  
**MC21D5**  
**MA21DN**  
**MD21DF**  
**MG21DH**  
**MG21DF**  
**MN21D5**  
**MGD1DR**  
**MOF1D51**


**Caution :**

- 1) Do not touch the terminals while power is being supplied.
- 2) Tighten terminal screws with the specified torque.
- 3) Always follow instructions stated in product leaflet.
- 4) Before installation, check to ensure that specifications agree with intended application.
- 5) Installation to be done by skilled electrician
- 6) Suitable dampers should be provided in the event of excessive vibrations.

**Suitability for use :**

These are products with Auto reset and Auto Switch On, hence never use the products for an application involving significant risk to life without ensuring that the system as a whole has been designed to address the risks and that our products are properly rated and installed for the intended use within the entire system or equipment.

**Notice :**

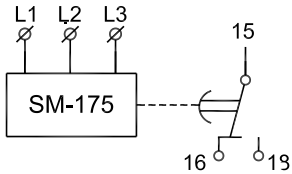
Product innovation being a continuous process, we reserve the right to alter specifications without any prior notice.

**SUPPLY MONITORING DEVICE  
SERIES: SM175**

**MAIN FEATURES :**

- Controls own supply voltage.
- Multi-voltage from 3x208 to 3x480 V
- LED status indication.
- SPDT Relay output (5A resistive)
- 30 to 40ms instant tripping for 2 & 3-phase interruption.
- Din Rail & Base mounting.

**CONNECTION DIAGRAM**



**FUNCTIONAL DESCRIPTION:**

**MK21D5**

- Controls:-
1. Correct sequence of three phases.
  2. Failure of any of three phases when voltage falls below rated minimum of threshold.

**MC21D5**

- Controls:-
1. Correct sequence of the three phases.
  2. Failure of any of the three phases.
  3. Failure due to Asymmetry fixed at 30%.

**MA21DN**

- Controls:-
1. Correct sequence of the three phases.
  2. Failure of any of the three phases .
  3. Failure due to Asymmetry adjustable from 5% to 15%.

**MD21DF**

- Controls:-
1. Correct sequence of the three phases.
  2. Failure of any of the three phases.
  3. Under & Over Voltage adjustable from 2 to 20% of Un  
(Up to - 12% across 3x208 V Range;  
Up to - 16% across 3x220 V Range;  
Up to +10% across 3x480 V Range)

**MGD1DR**

- Controls:-
1. Correct sequence of the three phases.
  2. Failure of any of the three phases.
  3. Under & Over Voltage adjustable from 5 to 25%.
  4. Failure due to Asymmetry fixed at 10%.

**MG21DH/MG21DF**

- Controls:-
1. Correct sequence of the three phases.
  2. Failure of any of the three phases.
  3. Under & Over Voltage adjustable from 5 to 25% of Un  
(Up to - 12% across 3x208 V Range;  
Up to - 16% across 3x220 V Range;  
Up to +20% across 3x440 V Range;  
Up to +10% across 3x480 V Range)
  4. Failure due to Asymmetry fixed at 10%.

**MN21D5**

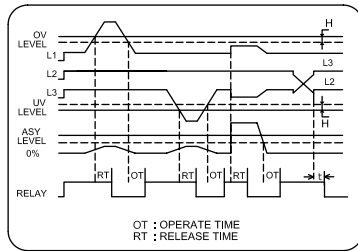
- Controls:-
1. Failure of any of the three phases.
  2. Failure due to Asymmetry fixed at 30%.

**MOF1D51**

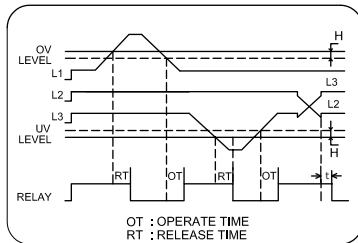
- Controls:-
1. Failure of any of the three phases.
  2. Failure due to Asymmetry fixed at 10%.

**FUNCTION DIAGRAM**

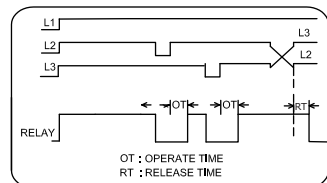
**MG21DH/MG21DF/MGD1DR**



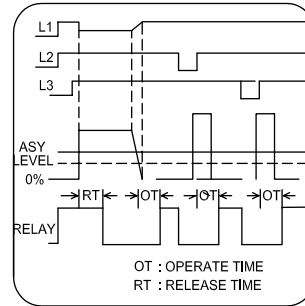
**MD21DF**



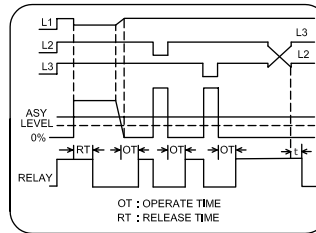
**MK21D5**



**MN21D5 / MOF1D51**



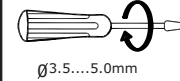


**MA21DN / MC21D5**



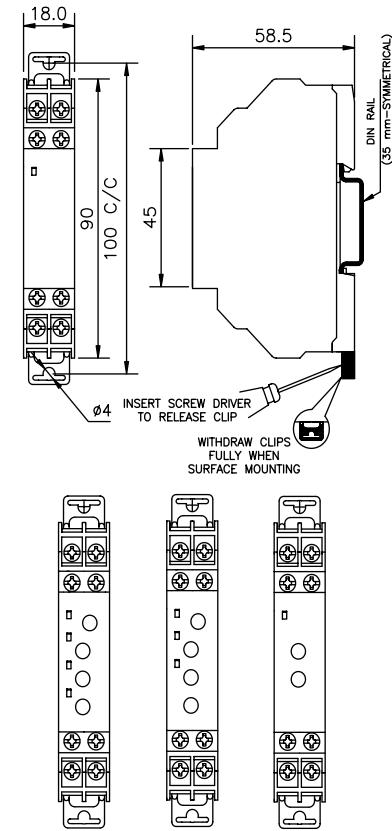
**Note:**

1. In case of MC21D5, MG21DH/MG21DF, phase imbalance levels are fixed. So, for very large motors with excessive back e.m.f. relay suitability to be checked by the user.
2. Minimum threshold supply voltage of tripping is 140 VAC for MK21D5, MC21D5.

**Terminal Details :**

	1.1 N.m (10 Lb.in) Terminal screw - M3.5
	2 x 0.2 ... 2.5 mm <sup>2</sup> Solid Wire
	1 x 24 to 10

**OVERALL MOUNTING DIMENSIONS (in mm)**



**CERTIFICATION :**

<b>EMI/EMC:</b>		
Harmonic Current Emissions	IEC 61000-3-2	Ed. 3.2 (2009-04) Class A
ESD	IEC 61000-4-2	Ed. 2.0 (2008-12) Level II
Radiated Susceptibility	IEC 61000-4-3	Ed. 3.2 (2010-04) Level III
Electrical Fast Transient Surge	IEC 61000-4-4	Ed. 3.0 (2012-04) Level IV
Conducted Susceptibility	IEC 61000-4-5	Ed. 2.0 (2005-11) Level III
Voltage Dips & Interruptions(AC)	IEC 61000-4-6	Ed. 2.2 (2006-05) Level III
Radiated Emission	IEC 61000-4-11	Ed. 2.0 (2004-03)
	CISPR 14-I	Ed. 5.2 (2011-11) Class B
<b>Safety:</b>		
Test Voltage Between I/P & O/P	IEC 60947-5-1	(2004) 2kV
Impulse Voltage Between I/P & O/P	IEC 60947-5-1	(2004) Level IV
Single Fault	IEC 61010-01	Ed. 3.0 (2010-06) Level IV
Insulation Resistance	UL 508	Ed.17 (1999-01) >50 kΩ
Leakage Current	UL 508	Ed.17 (1999-01) <3.5mA
<b>Environmental:</b>		
Cold Heat	IEC 60068-2-1	Ed. 6.0 (2007-03)
Dry Heat	IEC 60068-2-2	Ed. 5.0 (2007-07)
Vibration	IEC 60068-2-6	Ed 7.0 (2007-12) 5g
Repetitive Shock	IEC 60068-2-27	Ed. 4.0 (2008-02) 40g, 6ms
Non-repetitive Shock	IEC 60068-2-27	Ed. 4.0 (2008-02) 30g, 15ms