

# Voltage Monitoring Series SM 175

- Compact 17.5 mm Wide
- Protects against Phase Loss, Phase Reversal & Phase Asymmetry
- Multi-Voltage: Three Phase wire @ 208 - 480 VAC
- Selectable Under Voltage / Over Voltage & Asymmetry
- LED Indication for all Faults & for change in settings during run time for better security
- Adjustable Time Delay
- 1 C/O Configuration






## Ordering Information

Cat. No.	Description
MN21D5	208 - 480 VAC, Phase Loss Monitoring, 1 C/O
MK21D5	208 - 480 VAC, Phase Loss, Phase Sequence Monitoring , 1 C/O
MC21D5	208 - 480 VAC, Phase Loss, Phase Sequence, Phase Asymmetry Monitoring (30% Fixed), 1 C/O
MA21DN	208 - 480 VAC, Phase Loss, Phase Sequence, Phase Asymmetry Monitoring (5% to 15% Variable), 1 C/O
MOF1D51	208 - 480 VAC, Phase Loss, Phase Asymmetry Monitoring (10% Fixed), with trip time < 65 ms, 1 C/O

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Cat. No.		MN21D5	MK21D5	MC21D5	MA21DN
<b>Parameters</b>					
Supply Voltage ( $\phi$ )		208 - 480 VAC, (3 Phase 3 Wire)			
Supply Variation		-12% to + 10% (of $\phi$ )			
Frequency		50/60 Hz			
Power Consumption (Max.)		3.5 VA			
Trip Levels	Phase Loss	Yes	Yes	Yes	Yes
	Phase Sequence	N A	Yes	Yes	Yes
	Phase Asymmetry	N A	N A	30% Fixed	5% to 15%
Time Delay	ON Delay	< 750 ms	< 750 ms	< 750 ms	5s
	Trip Time (OFF Delay)	< 65 ms	100 ms	100 ms	0.5 to 15 s (Selectable)
Output	Relay Output	1 C/O			
	Contact Rating	5A @ 250 VAC / 30 VDC (Resistive)			
	Electrical Life	1X10 <sup>5</sup>			
	Mechanical Life	3X10 <sup>5</sup>			
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			
LED Indication	Healthy	Relay LED Continuous ON			
	Phase Reverse	N A	Relay LED Flashing		
	Asymmetry	Relay LED Off (Red Colour)	N A	Relay LED Off (Red Colour)	
Operating Temperature		- 15° C to +60° C			
Storage Temperature		- 20° C to +80° C			
Humidity (Non Condensing)		95% (Rh)			
Enclosure		Flame Retardant UL 94-V0			
Dimension (W x H x D) (in mm)		17.5 X 90 X 58.5			
Weight (unpacked)		70 g			
Mounting		Base / DIN rail			
Degree of Protection		IP 20 for Terminal, IP 30 for Enclosure			
Certification		  			

## EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

## Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

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## Ordering Information

Cat. No.	Description
MD21DF	208 - 480 VAC, UV / OV, Phase Loss & Sequence with Selectable OFF Delay, 1 C/O
MG21DH	208 - 480 VAC, UV / OV & SPP with Selectable ON Delay, 1 C/O
MG21DF	208 - 480 VAC, UV / OV & SPP with Selectable OFF Delay, 1 C/O
MGD1DR	208 - 480 VAC, UV / OV & SPP with Selectable ON Delay & OFF Delay, 1 C/O
MAE03D0200	115 VAC/DC or 240 VAC/DC, UV / OV with Selectable ON & OFF Delay, 1 C/O
MF31B0	220 VAC, Single Phase Under Voltage Relay
MF51B0	400 VAC, Three Phase Under Voltage Relay

UL Approval not applicable to Cat Nos. MN21D5, MOF1D51, MGD1DR, MAE03D0200, MF31B0, MF51B0

# Voltage Monitoring Series SM 175



Cat. No.		MD21DF	MG21DH	MG21DF	MGD1DR
<b>Parameters</b>					
Supply Voltage ( $\phi$ )		208 - 480 VAC, (3 Phase 3 Wire)			400 VAC, (3 Phase 3 Wire)
Supply Variation		-12% to + 10% (of $\phi$ )			
Frequency		50/60 Hz			
Power Consumption (Max.)		3.5 VA			
Settable Nominal Voltage		208 - 220 - 380 - 400 - 415 - 440 - 480 VAC			N A
Trip Levels	Phase Loss	Yes			
	Phase Sequence	Yes			
	Phase Asymmetry	N A		10% Fixed	
	Under Voltage	-2% to -20% (of $\phi$ )		-5% to -25% (of $\phi$ )	
	Over Voltage	+2% to +20% (of $\phi$ )		+5% to +25% (of $\phi$ )	
Time Delay	ON Delay	5 s	0.5 to 100 s (Selectable)	5 s	0.5 to 100 s (Selectable)
	Trip Time (OFF Delay)	0.5 to 15 s (Selectable)	5 s	0.5 to 100 s (Selectable)	0.5 to 15 s (Selectable)
Output	Relay Output	1 C/O			
	Contact Rating	5A @ 250 VAC / 30 VDC (Resistive)			
	Electrical Life	1X10 <sup>5</sup>			
	Mechanical Life	3X10 <sup>6</sup>			
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			
LED Indication	Healthy	Red LED: Supply Healthy → Continuous ON, Phase Reverse → Flashing			
	UV	Red LED: Under Voltage → Continuous ON			
	OV	Red LED: Over Voltage → Continuous ON			
	Asymmetry	Red LED: Asymmetry → Continuous ON			
	All LED's	Phase Fail or Higher Cut OFF(> 560 VAC) or lower cut off (<175 VAC), Blinking → Pot changed during running conditions			
Operating Temperature		- 15° C to +60° C			
Storage Temperature		- 20° C to +80° C			
Humidity (Non Condensing)		95% (Rh)			
Enclosure		Flame Retardant UL 94-V0			
Dimension (W x H x D) (in mm)		18 X 59 X 90			
Weight (unpacked) Approx.		70 g			
Mounting		Base / DIN rail			
Degree of Protection		IP 20 for Terminal, IP 30 for Enclosure			
Certification		  			

## EMI / EMC

Harmonic Current Emissions	IEC 61000-3-2
ESD	IEC 61000-4-2
Radiated Susceptibility	IEC 61000-4-3
Electrical Fast Transients	IEC 61000-4-4
Surges	IEC 61000-4-5
Conducted Susceptibility	IEC 61000-4-6
Voltage Dips & Interruptions (AC)	IEC 61000-4-11
Conducted Emission	CISPR 14-1
Radiated Emission	CISPR 14-1

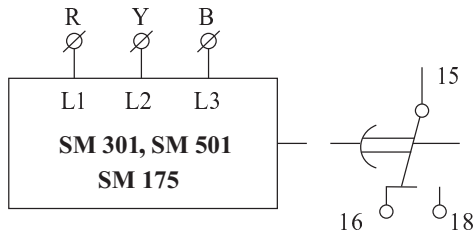
## Environmental

Cold Heat	IEC 60068-2-1
Dry Heat	IEC 60068-2-2
Vibration	IEC 60068-2-6
Repetitive Shock	IEC 60068-2-27
Non-Repetitive Shock	IEC 60068-2-27

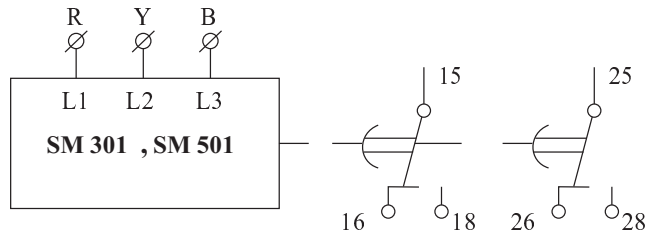
# Voltage Monitoring Series



## CONNECTION DIAGRAM

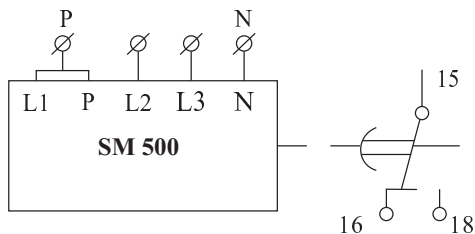


MA51BC, MA51BK, MN21D5, MK21D5, MC21D5  
MA21DN, MD21DF, MG21DH, MG21DF, MGD1DR

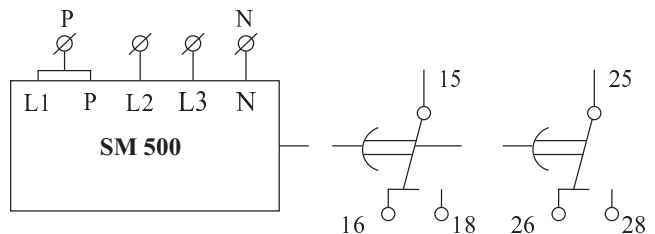


MG53BH, MG53BF, MG63BH, MG63BF  
MG53BI, MG53BO, MB53BM, MC21B5

## SINGLE PHASE

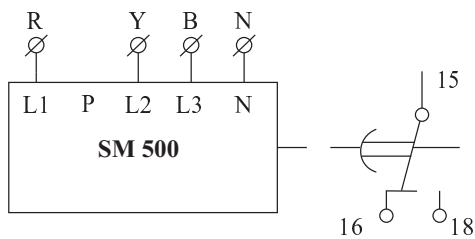


MD71BH, MD71BF, MD71B9

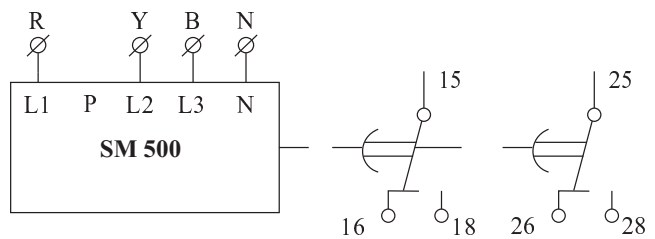


MG73BH, MG73BF, MG73B9

## THREE PHASE

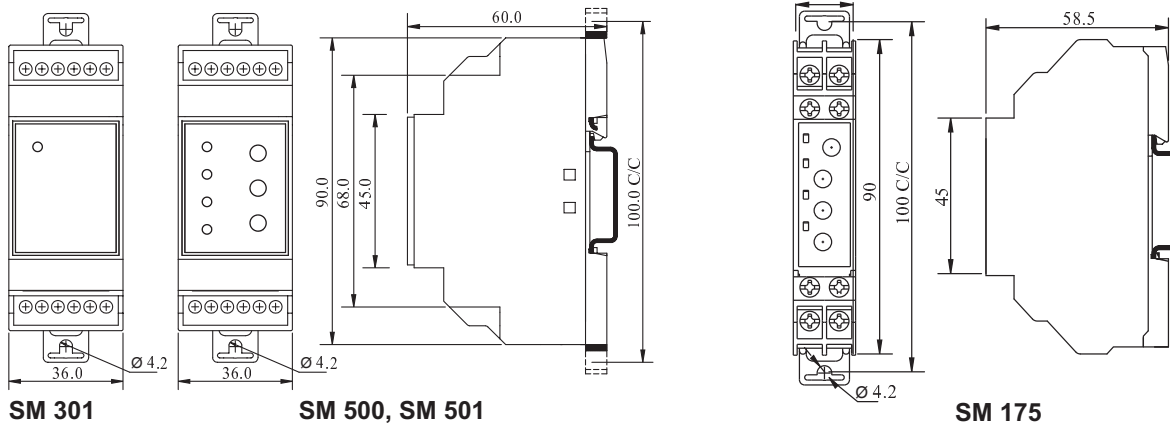


MD71BH, MD71BF, MD71B9





MG73BH, MG73BF, MG73B9, MAC04D0100 (P is not applicable in neutral loss)



## MOUNTING DIMENSION (mm)



## TERMINAL TORQUE & CAPACITY

 Ø 3.5	0.54 N.m (6 Lb.in)
	1 x 2.5 mm <sup>2</sup> Solid Wire/Stranded
AWG	1 x 24 to 12

**SM 301, SM 500, SM 501**

 Ø 3.5 mm....5.0mm	0.80 N.m (7.1 Lb.in)
	2 x 2.5 mm <sup>2</sup> Solid/Stranded Wire
AWG	2 x 20 to 14

**SM 175**